Misaligned Calendars, Missed Internships: Labor Market Costs of Coordination Frictions in Higher Education*

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Abstract

Administrative choices in higher education can have unintended consequences for students' careers. This paper examines the choice of academic calendar and the coordination frictions it creates when universities deviate from the prevailing norm. Using quasi-experimental variation in academic calendars across Ohio universities and data from LinkedIn profiles, I find that switching to the more prevalent semester system increases internship participation by 16%, with gains concentrated in labor markets where the semester calendar dominates. These additional internships improve students' post-college outcomes, including higher starting salaries and better job quality. The findings highlight the labor market consequences of seemingly internal institutional choices.

JEL classification: I23, I28, J31

Keywords: Internship, Academic Calendar, Higher Education, Labor Market

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1 Introduction

Colleges and universities make many administrative choices that appear purely academic, from curriculum design to degree requirements to the structure of the academic year. Yet these choices do not occur in isolation: they interact with labor market institutions in ways that can meaningfully shape students' career opportunities. This paper examines one such choice, the academic calendar, focusing on how deviating from the prevailing norm can create frictions that affect students' access to internships, a key early career opportunity.

Internships have become an increasingly important gateway to the labor market, with over two-thirds of graduating seniors in the U.S. reporting internship experience in 2024 (NACE, 2024). Securing an internship, however, requires coordination between students and firms, and a key dimension of this coordination is timing. Students need to be available when firms are recruiting and running their internship programs. In the United States, most universities follow a semester system that concludes in May, while a significant share operate on quarter systems that end several weeks later in June.[1] Since firms typically design their summer internship programs around the more prevalent semester schedule, quarter-system students may become available too late to participate in many of these opportunities. This paper shows that this timing friction is real and costly: universities deviating from the prevailing calendar face a coordination friction that restricts their students' access to internships and imposes lasting costs on their labor market outcomes.

The coordination challenges posed by the coexistence of two major academic calendars have drawn the attention of policymakers and universities.The coordination challenges posed by the coexistence of two major academic calendars have drawn the attention of policymakers and universities. The Ohio Department of Higher Education mandated that all public universities switch to the semester system primarily to ease student transfers between institutions. More recently, the University of California system, where most campuses operate on the quarter system, has been debating whether to adopt a common semester calendar, driven largely by a desire for better coordination within the system and with California's community college system.[2] However, transitioning to the semester system can be costly, both academically,

[1] As of 2023, 167 U.S. degree-granting institutions at the baccalaureate level or higher use quarter systems.

[2] A recent survey of over 1,200 UC faculty reveals sharply divided views on this question. While most concerns center

with negative impacts on four-year graduation rates (Bostwick et al., 2022), and financially.[3] These discussions have focused primarily on academic and financial considerations, leaving the potential labor market consequences of calendar choices largely unexamined.

This paper leverages quasi-experimental variation in academic calendars among colleges and universities in Ohio, the state with the highest number of calendar system transitions over the past 30 years. Using data from public LinkedIn profiles, I match students to the academic calendars they experienced and collect their self-reported internship experiences and post-college employment histories. Exploiting the staggered timing of academic calendar transitions in a difference-in-differences framework, I estimate the effects of switching to the more prevalent semester system on students' internship participation during college and their labor market outcomes after graduation.

Switching to the semester system substantially increases students' internship participation. Students are 1.17 percentage points more likely to participate in summer internships in a given year after their institution switches, representing a 28% increase relative to the sample mean, with a small offsetting decline in off-cycle internships taken during the academic term. At the individual level, fully exposed students graduate with 27% more summer internships and 16% more internships overall. To understand whether these gains reflect the coordination mechanism or some inherent feature of the semester calendar, I examine where the additional internships occur. The gains are concentrated in labor markets dominated by semester-system institutions, where employers have structured their internship programs around the semester calendar. In contrast, effects are close to zero in regions with non-negligible quarter-system presence, where employers already accommodate both calendar types. This regional pattern confirms that the benefits of switching stem from resolving a coordination friction rather than from any inherent feature of the semester calendar.

These additional internships under the semester system translate into meaningful labor market benefits. Fully exposed students are 1.2 percentage points more likely to land a non-

on research productivity and teaching disruption, some faculty believe switching would improve student access to summer internships. Many call for empirical evidence before committing to such a major change. `https://cucfa.org/2025/02/common-calendar-survey-results/`.

[3]The estimated cost of converting the University of California's quarter campuses to semesters ranges from $288 million to $371 million (`https://www.ucop.edu/institutional-research-academic-planning/content-analysis/academic-planning/final-apc-common-calendar-workgroup-report.pdf`).

entry-level first job after graduation and earn starting salaries that are $846 higher.[4] They are also more likely to enter high-paying occupations such as business, management, and engineering, and report having broader skill portfolios on their LinkedIn profiles. These salary gains persist at least four years after college graduation. Taken together, these findings illustrate how an institutional choice that appears purely academic, the structure of the academic year, can shape students' career trajectories in ways that extend well beyond their college years.

This study contributes to the literature as the first to document how institutional frictions causally affect college students' internship participation, a key channel through which institutional factors may influence students' labor market outcomes. Existing surveys and interviews (Hora et al., 2019, 2021) highlight academic, financial, and social barriers to securing college internships. This paper demonstrates that coordination frictions between higher education systems and labor markets reduce students' access to internships, thereby limiting an important pathway into the labor market.

This study specifically examines the role of academic calendars. It relates to the literature on the effects of calendar systems on postsecondary students.[5] Existing research has primarily focused on academic outcomes, showing that switching to semester systems negatively affects students' enrollment (Rosenthal, 2000) and academic performance (Gibbens et al., 2015), reduces students' credit hour loads and increases course withdrawals (Coleman et al., 1984). In their comprehensive analysis using panel data on nearly all four-year institutions in the U.S., Bostwick et al. (2022) find that transitioning from a quarter system to a semester system reduces on-time graduation rates by 3.7 percentage points.

In this study, I examine whether and how the academic calendar affects students' employment, including internship participation during college and labor market outcomes after graduation. While not the primary focus, Bostwick et al. (2022) also explores the relationship between academic calendars and summer internship participation. They use whether students

[4] I discuss whether and how these reduced-form estimates can shed light on the magnitude of labor market returns to internship experience, but I do not take a stance on the underlying mechanisms through which internships improve labor market outcomes.

[5] Broadly speaking, this study also relates to the literature that explores different school calendars in primary and secondary education. The school structures discussed in the literature include four-day school weeks (e.g., Anderson and Walker, 2015; Fischer and Argyle, 2018; Morton, 2021; Thompson, 2021), extended school days (Battistin and Meroni, 2016; Figlio et al., 2018), extended or shortened school years (Pischke, 2007; Parinduri, 2014; Aucejo and Romano, 2016), and year-round academic calendars (Graves, 2010, 2011; McMullen and Rouse, 2012; Graves, 2013; Depro and Rouse, 2015).

earned positive income during the summer from non-food-service and non-retail industries as a proxy for summer internships, finding limited evidence of positive effects. In contrast, this study identifies internship experiences directly from LinkedIn profiles. As a professional networking platform, LinkedIn allows students to share their education and employment history with connections and potential employers. Thus, LinkedIn profiles provide a more comprehensive record of career-relevant employment, including both paid and unpaid internships.[6] Beyond improving the measurement of internships, this study extends the analysis by examining the downstream effects of increased internship participation on post-graduation outcomes, contributing to the literature on the benefits of internships.

Finally, this study contributes to the literature on causal estimates of returns to internship participation. Using variation from mandatory internships at German universities, Margaryan et al. (2022) finds that internships reduce unemployment and increase earnings by 6%. Bolli et al. (2021) also reports positive income effects, while Klein and Weiss (2011) and Weiss et al. (2014) find no wage impact. Research from Yemen and Finland shows that students randomly offered internships or internship subsidies gain more work experience and earn more after graduation (McKenzie et al., 2016; Virkola, 2021), with similar findings in Portugal and Brazil (Silva et al., 2016, 2018; Della Rocca et al., 2025).[7] This study adds new causal evidence from the United States, leveraging quasi-experimental variation in internship participation due to changes in academic calendars.[8]

2 Background and Data

2.1 Academic Calendar Systems

In the United States, colleges and universities operate under different academic systems, with the semester system and the quarter system being the most common. The semester system, adopted by the majority of institutions, organizes the academic year into two 15- to 16-week

[6] Unlike Bostwick et al. (2022), which captures only paid employment, LinkedIn includes both paid and unpaid internships and covers students from both public and private institutions, whereas Bostwick et al. (2022) includes only public institutions.

[7] Complementary evidence from resume audit studies suggests that internship experience improves perceived employability (Pinto and Pereira, 2019; Jaeger et al., 2023) and increases the likelihood of receiving job interview invitations (Nunley et al., 2016; Baert et al., 2021).

[8] It also relates to research on the academic costs of student employment (e.g., Neyt et al., 2019), which documents that working during college may negatively affect academic performance.

terms (fall and spring), followed by a summer break. The quarter system splits the academic year into four 10-week terms. Students typically attend three quarters (fall, winter, and spring) and may take the summer as an optional quarter. There are two other systems that are much less common: the trimester system, which divides the year into three terms, and the four-one-four system, which includes two four-month blocks separated by a one-month block. Following the categorization in Bostwick et al. (2022), I classify the trimester system as the quarter system and the four-one-four system as the semester system in the analysis due to their relative similarities in scheduling.[9]

Compared to the semester system, the quarter system features shorter terms with fewer courses taken simultaneously, making it more flexible for course scheduling but also resulting in an increased pace and more frequent evaluations. More relevant to this study, the two systems also differ in the timing of the summer break. Under the semester system, the academic year typically concludes in May and resumes in late August. In contrast, under the quarter system, the school year ends in June and recommences in September. Since many firms structure their internship programs according to the more prevalent semester system schedule, students on the quarter system often miss these opportunities because their summer break starts about a month later.[10]

The data on the academic calendar of each institution are obtained from the Integrated Postsecondary Education Data System (IPEDS). IPEDS is maintained by the U.S. Department of Education's National Center for Education Statistics. It gathers information from every institution that participates in federal student financial aid programs. Specifically, for each academic year, all institutions report their predominant calendar system. The options include semester, quarter, trimester, four-one-four, other nontraditional academic systems, or calendars that differ by program.

In this study, the analyses focus on institutions in Ohio, as it is the state that has experienced the most transitions from quarter systems to semester systems over the past 30 years.[11] This is mainly because the Ohio Department of Higher Education mandates that all public

[9] The empirical results are robust to excluding the three institutions in the sample that have ever used the trimester or four-one-four systems.

[10] For example, approximately 40% of internships started in the month of May in Ohio in 2019, while around 15% started in the month of June.

[11] Appendix Figure A1 compares the prevalence of quarter systems between 1995 and 2019. The share of institutions using quarter systems in Ohio decreased from above 30% to below 5%.

universities and colleges in Ohio switch to semester systems. Specifically, the policy required all public institutions that were operating under quarter systems to adopt the semester system by the fall of 2012.[12] The goal of the policy is to make it easier for students to transfer between institutions. Using records from IPEDS, I constructed a panel that includes the academic calendars of all degree-granting institutions in Ohio that are at the baccalaureate level or higher, spanning from 1990 to 2019. To study the impact of the transition from quarter to semester systems, I restrict the sample to institutions that initially operated under quarter systems between 1990 and 1995.[13] For each institution, I identify the academic year in which it transitioned to a semester system, and exclude those that used non-traditional calendars or underwent multiple calendar transitions.

Appendix Table A1 lists the 17 colleges and universities included in the final sample for analysis. These institutions transitioned from the quarter system to the semester system between 1996 and 2013, except for Franklin University, which remains on the trimester system. Many of these universities have multiple campuses across the state, and campuses belonging to the same university share the same year of transition. As of 2019, these institutions collectively enrolled approximately 55% of the total undergraduate student population in Ohio.

Because the main analysis sample from Ohio does not include enough "never-treated" universities that used the quarter system throughout the sample period, I show in Appendix B that the results are robust to including comparable "never-treated" universities from Oregon and Washington as a control group.

2.2 LinkedIn Profiles

Students' educational and employment records are obtained from their public LinkedIn profiles through Revelio Labs. LinkedIn is a business- and employment-focused social media platform. It first launched in 2003 and now has 200 million users in the U.S. The platform is more commonly used by college-educated white-collar workers, the sample this study intends to focus on. Through Revelio Labs, I have access to all public profiles created by LinkedIn users as of early 2023. LinkedIn profiles serve as online resumes where individuals share their

[12] https://transfercredit.ohio.gov/educational-partners/educational-partner-resources/academic-calendar-conversion/overview.

[13] The results remain robust when including the "always treated" units.

education and employment histories with their connections, recruiters, and the general public. The education section includes the institutions users have attended or are currently attending, years of attendance, and degrees obtained or in progress. The employment section includes users' past and current employers, employment start and end dates (year and month), job titles, and brief job descriptions.

Revelio Labs preprocesses the raw data. First, they predict users' genders by feeding their first names into a model trained on the Social Security Administration data. Similarly, they predict users' race and ethnicity using a model trained on U.S. Census data, which considers users' first names, last names, and locations. For each employment record, Revelio Labs assigns a seniority level and an O*NET code based on the job title, company, and industry. Finally, Revelio Labs imputes the salary for each position using information specific to the position, including job title, seniority level, company, and location, as well as user-specific information such as years of experience. The model is trained on salary data from publicly available labor certification applications, self-reported data, and information from online job postings.[14]

The main sample of analysis includes college students with public LinkedIn profiles who were enrolled in the 17 Ohio colleges and universities between 1990 and 2019.[15] For each student, I observe their imputed demographics, duration and field of study, and post-graduation outcomes. The post-graduation outcomes include whether they enroll in advanced degree programs, when they start their first job, as well as the imputed salary, seniority level, and occupation of their first job. Most importantly, I identify all their internship experiences while enrolled in college. An employment record is classified as an internship if the job title includes the keyword "intern" or "internship." Following Bostwick et al. (2022), I classify an internship experience as a "summer internship" if it begins between April and September of the year.[16] I refer to the remaining ones as "off-cycle internships." Appendix Table A2 provides the summary statistics. On average, a student reports completing a total of 0.28 internships while in college, with the majority being summer internships. Appendix Figure A2 plots the share of students who report internship participation on LinkedIn, by year of

[14]The imputed wage data have been validated and used by Amanzadeh et al. (2024) and Dorn et al. (2024).
[15]Years after 2020 are excluded to avoid the impact of the COVID-19 pandemic.
[16]This definition of summer is broad enough to cover the summer break for students on both semester and quarter systems.

college entry. The rapidly growing trend reflects both the increased reporting on LinkedIn and a rise in internship participation.

3 Internship Participation: Individual-by-Year Level Analysis

3.1 Empirical Strategy

I exploit the staggered transitions from quarter to semester systems to estimate the impact of the academic calendar on students' internship participation. Specifically, I build a panel data with students enrolled at the 17 Ohio institutions between 1990 and 2019, recording whether they participated in internships in each calendar year. As a baseline specification, I estimate the following two-way fixed-effect (TWFE) event study model with staggered adoption:

$$Y_{ist} = \sum_{k=-7}^{7} \theta_k SemSys_{stk} + \gamma_s + \eta_t + \rho_{g(s)} \times t + \varepsilon_{ist}, \tag{1}$$

for student i who enrolls at institution s in calendar year t. The outcome variable Y_{ist} denotes whether student i from institution s participates in internships in year t. In particular, I consider three different measures: (1) whether a student participates in a summer internship, (2) whether a student participates in an off-cycle internship, and (3) whether a student participates in any internship during the year. For example, for a student enrolled at Ohio State University from 2010 to 2014, I examine whether the student participated in internships in each calendar year t—2010, 2011, $\cdots$, and 2014—and distinguish between summer and off-cycle internships.[17]

The variable $SemSys_{stk}$ is an indicator for k years since institution s transitioned to the semester system. For Ohio State University, which transitioned to the semester system in the fall of 2012, $k = 0$ in the calendar year $t = 2013$, $k = -1$ in calendar year 2012, and $k = 1$ in 2014.[18] I normalize the coefficient in the year immediately preceding the switch (θ_{-1}) to zero. θ_ks are the coefficients of interest. Following Bostwick et al. (2022), I assume the effect of the treatment at least seven years before or after the shift to be unchanging, with the average

[17] I measure internships by calendar year rather than academic year because LinkedIn profiles only show the calendar year of enrollment, making it difficult to determine the specific term in which the student started.

[18] Since this study focuses on summer internships, and the transition to the semester system occurred in the fall of 2012, I consider 2012 as the year before the treatment and 2013 as the first year of treatment. The results are not sensitive to an alternative coding of the first treatment year as quarter 4 of 2012 to quarter 3 of 2013.

effects being captured by θ_{-7} and θ_7. γ_s and η_t denote the institution and calendar year fixed effects, respectively. I additionally control for group-specific linear time trends $\rho_{g(s)} \times t$, where a group includes the institutions that made the transition in the same year. The standard error ε_{ist} is clustered at the institution level.

To better quantify the average treatment effect, I also estimate the TWFE staggered difference-in-differences model:

$$Y_{ist} = \beta SemSys_{st} + \gamma_s + \eta_t + \rho_{g(s)} \times t + \varepsilon_{ist}. \tag{2}$$

The model includes similar covariates as in equation (1), but instead of examining each year relative to the transition separately, it uses a single dummy variable, $SemSys_{st}$, indicating whether institution s operates under the semester system in calendar year t. The coefficient β captures the average treatment effect of transitioning to semester systems, assuming (1) parallel trends and (2) treatment effect homogeneity.

The parallel trends assumption requires that students' internship participation across different institutions would have followed the same trend if they had all continued using the quarter system. I control for any institution-specific, time-invariant variations by including institution fixed effects, and I account for any time trends in internship participation that are common across all institutions by including year fixed effects. Additionally, by including adoption group-specific linear trends, I control for the possibility that institutions adopting the semester system in different years were following differential linear trends in internship participation. This provides a weaker version of the parallel trends assumption, requiring only that institutions follow their group-specific differential linear trends in the absence of treatment. I also present the results without group-specific linear trends, as well as the results with institution-specific linear trends.

Since I use students' self-reported internship experiences on their LinkedIn profiles as a proxy for actual internship participation, the parallel trends assumption also requires that students' engagement with LinkedIn is uncorrelated with the transition to semester systems. Any institution-level heterogeneity and overall time trends in LinkedIn usage are accounted for by including institution and year fixed effects. In Appendix Table A3, I further show that students' LinkedIn usage, measured by the share of graduates with profiles, the share reporting

employment information, the share with recent profile updates, and the average number of connections, is unrelated to changes in the academic calendar. It is also important to ensure that students do not select institutions based on the current or future academic calendar. Appendix Table A4 verifies that the characteristics of students enrolled at these institutions do not change in response to the transition to semester systems. Finally, to rule out any anticipation effects, I visually examine the estimates of equation (1) prior to the calendar transition and find no evidence that students delayed their internships in anticipation of the future adoption of semester systems or any other forms of pretrends.

We additionally require that the treatment effects are homogeneous across institutions and over time to interpret the coefficient of interest β in equation (2) as the average treatment effect on the treated (e.g., De Chaisemartin and d'Haultfoeuille, 2020; Goodman-Bacon, 2021). I later relax this assumption by presenting results using heterogeneity-robust estimators. As an alternative approach to address concerns about heterogeneous treatment effects (Goodman-Bacon, 2021), I also include additional universities outside Ohio that used quarter systems throughout the sample period as a control group. Appendix B shows that the results are robust to the inclusion of these additional "never-treated" universities.

3.2 Baseline Results

Figure 1(a) presents the estimates of θ_k from equation (1) for the three measures of internship participation. The near-zero and statistically insignificant coefficients before the transition to semester systems suggest that the parallel trends assumption is met. There are no significant deviations from trends in internship participation (in the summer or other seasons) across institutions with different calendar change timings. We observe a significant increase in summer internship participation in the year immediately following the adoption of semester systems. The treatment effects remain stable, with a slight increase over time, possibly due to an overall rise in internship participation and reporting on LinkedIn.

Meanwhile, internship participation during non-summer seasons decreases after the transition to the semester system. This may be because students under semester systems take more courses concurrently, making it harder to add an internship to their schedules during the academic term. It could also reflect a crowding-out effect, as students may be less likely

to pursue off-cycle internships when more summer opportunities are available. The decline in off-cycle internships further supports the argument that the increase in summer internships is not driven by differential trends in LinkedIn usage or reporting across institutions, as both types of internships would likely have increased if differential trends were the primary driver. Despite the decrease in off-cycle internships, students experience a net increase in internship participation under semester systems.

Panel A of Table 1 reports the results from equation (2), where I control for adoption group-specific linear time trends. Columns (2), (4), and (6) also control for student characteristics, including imputed gender, imputed race and ethnicity, and fields of study in college. The estimates remain unchanged with the inclusion of student characteristics. Column (2) suggests that, under the semester system, students are 1.17 percentage points (pp) more likely to undertake internships *each summer*, which represents a 28% increase relative to the sample mean. Meanwhile, column (4) indicates a slight, statistically insignificant decrease in off-cycle internship participation under the baseline specification. Overall, according to column (6), students are 1.00 pp (18%) more likely to have internship experiences *each year* after their institutions transition to semester systems. The magnitude of the average treatment effect should be interpreted with caution because we only observe internship experiences listed on LinkedIn profiles. Given that not everyone reports every internship experience they had, especially individuals who were in college many years before LinkedIn became available, it is not possible to directly map the sample mean or the estimates one-to-one to actual internship participation. However, the 18% *relative* increase compared to the sample mean is informative and suggests that academic calendars can have large impacts on internship participation.

Where do the additional internships come from? During the sample period, there is a growing trend in internship participation. The findings show that students under semester systems experience a larger increase compared to those who remain on quarter systems. Appendix Table A5 suggests that the additional internships among semester-system students are distributed across a variety of industries, including high-paying industries such as Information, Finance and Insurance, and Professional, Scientific, and Technical Services.

3.3 Mechanism

Next, I explore the mechanisms behind the increase in internships, specifically whether it is driven by inherent features of the semester calendar or by the alignment of schedules with most other institutions. The latter explanation implies that quarter-system students in semester-dominant labor markets face coordination friction, specifically the timing mismatch between when internships typically begin and when quarter-system students become available. While semester-system students are available from mid-May onward, quarter-system students cannot begin until after mid-June, effectively excluding them from any internship that starts before then. Figure 2 documents the relevance of this constraint: in states where quarter-system institutions are rare, internship starts are heavily concentrated in May, a month in which quarter-system students are entirely unavailable.[19] In contrast, in states with non-trivial quarter-system presence, start dates are distributed more evenly across May and June, reflecting employer accommodation of both calendar types. This asymmetry suggests that labor markets have converged around semester schedules where the quarter system is uncommon, leaving quarter-system students structurally locked out of a disproportionate share of opportunities in those labor markets.

To test whether switching to semesters resolves this coordination friction, I examine where the additional internships occur by splitting the sample based on the quarter-system presence in the state where the internship takes place. Panel B of Table 1 examines internships in states where at least 10% of undergraduates attend quarter-system institutions. In these labor markets, employers are accustomed to accommodating both calendar types, and the effects of switching to semesters on summer internship participation are close to zero and statistically insignificant. Panel C restricts to internships in states where quarter-system institutions are rare, accounting for no more than 10% of undergraduates. Here the effects are positive and statistically significant: switching to semesters increases the probability of securing a summer internship in these markets by 0.30 percentage points, a 33% increase relative to the sample mean. This contrast is the central evidence for the coordination mechanism: students gain internships in markets where coordination frictions are present, and see no gains in markets

[19] LinkedIn records only the year and month of employment start dates, so we cannot distinguish whether a June internship begins before or after mid-June.

where employers already accommodate both calendar types.

The regional pattern in Panels B and C also addresses an alternative interpretation of Figure 2. One might argue that the concentration of May starts in low quarter-system presence states simply reflects student availability rather than employer scheduling norms. Since most students in those states are on semester schedules, they become available in May, mechanically producing the May spike. Under this interpretation, employers are perfectly flexible about start dates, quarter-system students could negotiate a later start with no friction, and the gains from switching calendars should not vary with local quarter-system presence. The evidence, however, shows the opposite: effects are concentrated where quarter-system presence is low. This implies that employers in low quarter-system presence states have structured their internship programs around semester schedules and are not fully accommodating the later start dates that quarter-system students require.

Panel D of Table 1 examines internships within Ohio separately, as Ohio does not cleanly belong to either Panel B or Panel C given its changing quarter-system presence over the sample period. The absolute effects are larger than those in Panels B and C, reflecting the fact that Ohio students are more likely to intern locally. The relative magnitude of 26%, however, falls between those of Panels B and C, consistent with Ohio being a labor market in transition between the two regimes. Panel E examines internships outside the United States. Semester systems are dominant worldwide, so students who finish their academic year in May rather than June have a longer window to pursue international opportunities over the summer. Consistent with this, switching to semesters increases international internship participation, with a relative magnitude of 57%, the largest across all panels.

Taken together, these findings suggest that the gains from switching to semesters stem from schedule alignment with the broader labor market rather than any inherent feature of the semester calendar. Quarter-system students face a structural disadvantage in markets where semester schedules are the norm, and switching resolves this friction by bringing their availability in line with employer expectations.

3.4 Robustness

Appendix Figure A3 and Appendix Table A6 show the results under alternative specification. Appendix Figure A3(a) presents the estimates without group-specific linear time trends, showing slight differences in the trends that different institutions followed prior to the calendar change, which leads to an overestimated average treatment effect (Panel A of Appendix Table A6). Figure A3(b) and Panel B of Appendix Table A6 report the results with institution-specific linear trends instead of group-specific trends, which do not impact the estimates. Figure A3(c) and Panel C of Appendix Table A6 report the results excluding the first and fifth or later years of college enrollment for each student. For a typical student who enrolls in the fall of their first year and graduates before the summer of their final year, internship participation during those partial years is unlikely to be affected by the academic calendar. By focusing only on the three full calendar years in college, this specification also addresses the concern that students who do not graduate on time are more heavily weighted in the baseline sample. The average treatment effects are larger after excluding the partial and extra years. Finally, Appendix Figure A3(d) and Panel D of Table A6 include graduate students in the analysis and find a smaller treatment effect than when focusing only on undergraduate students in the baseline specification.

Additionally, in Appendix Table A7, I estimate the impact of switching to semester systems on internship participation *separately* for the summers following years 1, 2, and 3 of college. The point estimate is strongest in the summer before senior year, driven entirely by the higher baseline internship participation during that summer. Appendix Table A8 shows that the results are robust to excluding the three institutions in the sample that were ever on trimester or four-one-four systems. Appendix Table A9 examines how switching to semester systems affects the *joint* distribution of students' summer and off-cycle internship participation.

More importantly, recent econometric literature points out that TWFE estimators in staggered setups require homogeneous treatment effects across both units and time periods to ensure consistency. Alternatively, I employ newly proposed methods that are robust to potential heterogeneity in treatment effects (Callaway and Sant'Anna, 2021; Sun and Abraham, 2021; Borusyak et al., 2024; De Chaisemartin and d'Haultfoeuille, 2024). Figures 1(b)-(d) present the results separately for the three measures of internship participation. Although

different estimators are not perfectly comparable to one another due to differences in sample selection and methodology, it is reassuring to see that the heterogeneity-robust estimators exhibit patterns very similar to those of the TWFE estimators.

Finally, I show in Appendix B that the results are robust to the inclusion of universities from Oregon and Washington that used quarter systems throughout the entire sample period as a control group.

4 Post-Graduation Outcomes: Individual Level Analysis

4.1 Empirical Design

To estimate the impact of semester systems on students' total number of internships while in college and on their post-graduation outcomes, I conduct an individual level analysis that leverages the variation in their entry years relative to the year of the calendar change. Specifically, I consider a student as fully exposed to the semester system if she enters college in the year of or after the transition to semester systems. I consider a student as partially exposed if she enters college one or two years before the transition, meaning that her institution transitions to semester systems during her sophomore or junior years. I do not consider students who are in their senior year at the transition as treated because, if they graduate on time, there are no summers left for them to do internships while in college. Some students do not graduate on time, so they become de facto exposed by spending extra years in college. However, as shown in Bostwick et al. (2022), the on-time graduation rate is endogenous to academic calendars. Therefore, rather than using their actual exposure, I define it as "intended" exposure assuming everyone graduates on-time and estimate the intent-to-treat effects.

I estimate the same TWFE event study model as in equation (1) but at the individual level, with t now denoting the college entry year of student i. The outcome variable Y_{ist} represents the number of internships or some post-graduation outcomes of student i who enters institution s in year t. The θ_ks are the coefficients of interest: θ_0 captures the treatment effect for students who enter college in the year of the calendar change, and θ_{-1} (θ_{-2}) captures the effect for students who are in their sophomore (junior) year when the institution transitions to a semester system. I normalize θ_{-3} to zero. Similarly, I control for institution and entry year

fixed effects and group-specific linear trends, and cluster standard errors at the institution level.

I also estimate the difference-in-differences model that is parallel to equation (2):

$$Y_{ist} = \beta_1 Partial_{st} + \beta_2 Full_{st} + \gamma_s + \eta_t + \rho_{g(s)} \times t + \varepsilon_{ist}, \tag{3}$$

where $Partial_{st}$ denotes whether students who enter institution s in year t are partially exposed to semester systems if they graduate on time, and $Full_{st}$ denotes whether they are fully exposed. The sample for analysis includes college students who entered the 17 institutions in Ohio between 1990 and 2015. I exclude students who spent fewer than four years or more than six years in college.[20] I conduct a placebo analysis and show in Appendix Table A4 that students' characteristics, including gender, racial minority status, and fields of study, do not change in response to the transition to semester systems. This helps alleviate concerns that students select institutions based on their academic calendars.

4.2 Results

Figure 3 presents the estimates from the event study model. Figure 3(a) overlays the coefficients for three internship measures: the total number of internships undertaken throughout college that are (1) summer internships, (2) off-cycle internships, and (3) both types combined. There are no differential pretrends in internship participation across institutions that transitioned to semesters in different years. The coefficients suggest that students graduate with significantly more summer internships if their institutions transition to a semester system in their junior or sophomore years. The effects are stronger if the transition occurs in their freshman year or before they enroll. Meanwhile, we observe a small and marginally significant decrease in off-cycle internship participation for students who are partially or fully exposed to semester systems. The increase in summer internships outweighs the decrease in off-cycle internships, leading to more overall internship experiences, especially for students who are fully exposed.[21]

[20] Bostwick et al. (2022) finds transitioning to semester systems reduces four-year graduation rates but has no significant impact on six-year graduation rates.

[21] Appendix Figure A4 presents the heterogeneity-robust estimators separately for the three internship measures. I exclude the Callaway and Sant'Anna (2021) estimator because the number of covariates is too large given the sample size. I also show in Appendix B that the results are robust to including additional universities outside Ohio that used

Figure 3(b) shows the impact of semester systems on the share of students with a non-entry-level first job after college. Specifically, I use the seniority levels imputed by Revelio Labs, which characterize positions such as assistants, clerks, and trainees as entry level. The coefficients suggest that students exposed to semester systems are more likely to have their first non-internship job after college classified as non-entry-level, although the estimates are noisier and only marginally significant. Figure 3(c) shows the impact of semester systems on students' starting salaries. The outcome variable is the imputed starting salary of students' first non-internship job after college, adjusted to 2010 dollars. Students who are partially exposed to semester systems earn higher starting salaries, and the effects are larger and statistically significant for students who are fully exposed. Appendix Figure A5 examines medium-term outcomes. I track students' employment positions eight years after college entry and find that the salary gains associated with semester systems persist, while the effect on seniority diminishes.

Table 2 presents the regression results from equation (3). According to column (1), students who are partially exposed to semester systems complete 0.034 more summer internships throughout college, while fully exposed students complete 0.068 more summer internships—a 27% increase relative to the sample mean. However, column (2) suggests that the transition to a semester system decreases the number of off-cycle internships by 0.014 for fully exposed students. Overall, when institutions transition to semester systems, students who are partially exposed have 0.025 more internships in college (statistically insignificant), and fully exposed students have 0.054 more internships, a 16% increase relative to the sample mean of 0.339 internships.[22] These results are consistent with the findings from the individual-by-year level analyses. For post-graduation outcomes, column (4) shows that partial exposure to semester systems makes students 0.8 pp more likely to land a non-entry-level job after college, while full exposure increases this likelihood by 1.2 pp, or 2.2% relative to the sample mean. Column (5) shows a positive but statistically insignificant change in starting salary for partially exposed students, and a significant $846 (1.5%) increase in salary for fully exposed students.

Table 2 finds that when institutions adopt semester systems, students gain more (summer)

quarter systems throughout the entire sample period as a control group.

[22] Appendix Table A10 shows that, as the number of internships changes, exposure to semester systems increases students' earnings from summer internships and decreases earnings from off-cycle internships.

internship experiences and see improved labor market outcomes after college. Descriptively, this finding is consistent with the literature, which suggests that internship participation increases labor market opportunities and boosts earnings. However, caution is needed in interpreting these reduced-form estimates as a causal quantification of the impact of internships on labor market outcomes, for two main reasons. First, the exclusion restriction is not satisfied if we use calendar changes as an instrument for internship participation. Specifically, academic calendars can influence students' labor market outcomes through channels other than internships, such as academic performance. For instance, Bostwick et al. (2022) finds that students have worse academic performance and lower on-time graduation rates under semester systems.[23] Assuming that academic performance is positively correlated with labor market outcomes, this implies that IV estimates will *underestimate* the benefits of internship participation on labor market outcomes.

Second, the magnitudes should be interpreted with caution because LinkedIn profiles do not necessarily include all internship experiences or complete employment histories. If we assume that, during the sample period, students have an average of 0.7 internships throughout college, this implies that only half (0.339/0.7) of these internships are listed on their LinkedIn profiles. Assuming that this is a *random* half, the point estimate of the effect of full exposure to semester systems on the number of internships (0.054) is about half of the actual magnitude. Even if the exclusion restriction holds, the IV estimate of the effect of one additional internship on earnings ($846/0.054) would be twice the actual magnitude.

Therefore, I rely on the relative magnitudes to interpret the results. According to column (3), students' internship participation increases by 16% (0.054/0.339) if they are fully exposed to semester systems. Assuming the exclusion restriction holds, this 16% increase in internship participation leads to an $846 increase in their starting salaries. By linear extrapolation, the results suggest that students' starting salaries would increase by $5,287.5 if their total number of internships in college were to double.[24] Similarly, the likelihood of students finding a non-entry-level job after college would increase by 7.5 percentage points if their number of internships doubled. Finally, considering the likely violation of the exclusion restriction, it is

[23] Student employment may also affect academic performance. Neyt et al. (2019) provides a comprehensive review.

[24] The $5,287.5 salary increase substantially exceeds the typical return to a few months of work experience, indicating that internships generate benefits beyond simple experience accumulation.

possible that these labor market benefits of internships are underestimated and may actually be stronger.

The analyses do not take a position on the specific mechanisms through which internships improve labor market outcomes. The positive effects may reflect human capital accumulation, signaling, expanded professional networks, or a combination of these factors.

4.3 Additional Results

I explore whether increased internship experience under semester systems affects other post-graduation outcomes. Appendix Table A11 illustrates how students enter different occupations when their institutions transition to semester systems. Based on the O*NET code of their first job after college, I find that more students enter high-paying occupations (i.e., business and management, engineering, and mathematics) when they are exposed to semesters. This may help explain the positive impact on students' earnings after college. The benefits in the labor market could be further amplified in the long run if we consider the network effects of having more alumni holding senior positions in high-paying occupations.

Appendix Table A12 examines the likelihood that students' first post-college employment is in the same company, industry, or occupation as one of their internships. The estimates suggest that under semester systems, students are more likely to receive and accept "return offers," i.e., jobs at the same companies where they complete internships.

Using self-reported skills from LinkedIn profiles, I examine whether exposure to semester systems affects students' skill accumulation. Despite being self-reported and potentially noisy, skills listed on LinkedIn profiles provide an informative measure of individual human capital (Dorn et al., 2024). Appendix Table A13 shows that students fully exposed to semester systems are more likely to report any skills on their profiles and list on average 0.3 more skills overall. The higher likelihood of reporting any skills could partly reflect that these students are more adept at using professional platforms, which is itself a form of soft skill. Classifying skills along two dimensions, hard versus soft and practical versus research,[25] fully exposed students

[25] Hard skills are specific, teachable, and job-specific (e.g., Python, accounting, AutoCAD), while soft skills are interpersonal and transferable (e.g., leadership, communication, teamwork). Practical skills are hands-on and industry-focused (e.g., sales, marketing, Salesforce), while research skills are scholarly or theoretical (e.g., statistics, laboratory methods, curriculum development).

list significantly more soft and practical skills, while the effect on hard skills is positive but imprecisely estimated. The null result on research skills is consistent with the expectation that internship exposure drives industry-relevant rather than academic skill accumulation. Since skills are observed as of 2023 without information on when they were acquired, they could reflect human capital built during internships, skills developed through the more senior and higher-paying jobs that internship experience helped students access, or both.

I also explore whether academic calendars affect students' pursuit of advanced degrees. Appendix Table A14 shows that exposure to semester systems does not affect the gap between college graduation and students' first job. The likelihood of students pursuing advanced degrees (one year, three years after graduation, or ever) remains unchanged. However, semester systems appear to reduce the likelihood of earning a doctorate degree by 0.6 pp (8.3%, statistically insignificant). It suggests that semester systems may be less academically beneficial, consistent with Bostwick et al. (2022).

Appendix Table A15 shows little impact of academic calendars on students' participation in non-internship positions, such as teaching or research assistant roles, while in college.

Robustness Appendix Table A16 reports the results of alternative specifications of equation (3). Panel A excludes student characteristics (gender, race and ethnicity, and field of study) as covariates in the regression. Panel B controls for institution-specific linear trends instead of group-specific trends, and Panel C includes all college students regardless of their duration of study. The results are quantitatively similar to the baseline results in Table 2.

Heterogeneity Appendix Tables A17, A18, and A19 present the heterogeneity of individual-level analyses by gender, racial minority status, and fields of study. Overall, the adoption of semester systems increases internship participation across all student backgrounds, especially for female and racial minorities, and for students who major in business, economics, and engineering. However, it seems that male and white students enjoy larger benefits for labor market outcomes, along with students majoring in business and economics.

5 Conclusion

Colleges and universities routinely make administrative decisions that appear to have little bearing on students' career prospects. This paper shows that the academic calendar is one such decision with consequences that are far from trivial. Using quasi-experimental variation in calendar transitions across Ohio institutions and data from public LinkedIn profiles, I find that switching to the more prevalent semester system resolves a coordination friction that meaningfully expands students' internship opportunities. Fully exposed students graduate with 16% more internships, are more likely to land non-entry-level jobs, earn higher starting salaries, and accumulate broader skill portfolios over their careers. These gains stem from schedule alignment with the broader labor market rather than any inherent feature of the semester calendar, implying that the costs of calendar misalignment fall disproportionately on students at minority-calendar institutions.

These findings speak directly to ongoing policy debates. The University of California system, currently weighing whether to adopt a common semester calendar, has identified the lack of empirical evidence on labor market consequences as a key gap in its deliberations. This paper provides some of that evidence, suggesting that calendar alignment carries meaningful labor market benefits for students that deserve to be weighed alongside the well-documented academic and financial costs of transition. More broadly, the findings suggest that the design of the academic year, typically treated as an internal institutional matter, is in fact a labor market policy with measurable consequences for students' long-run outcomes.

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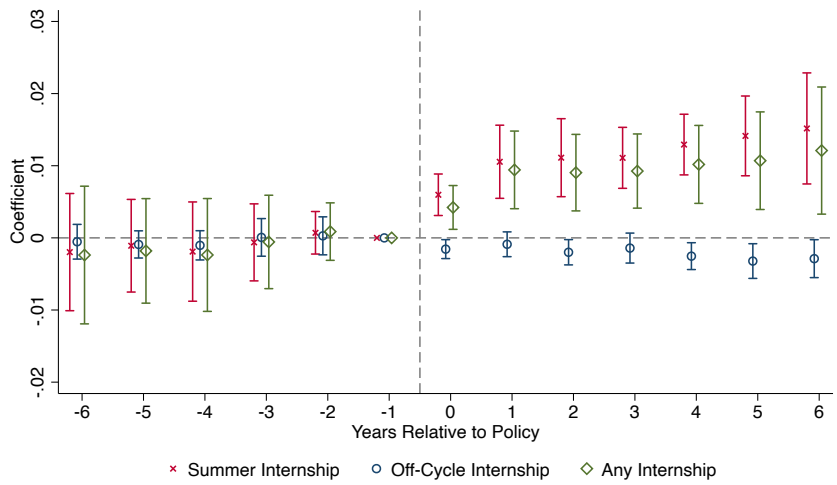
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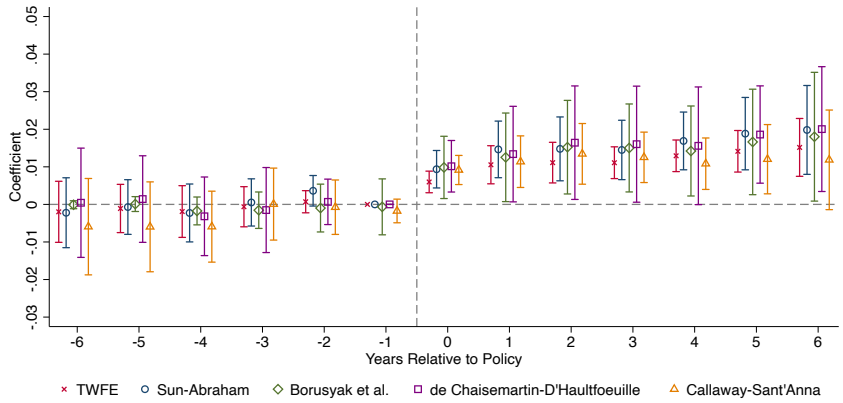
Figures and Tables

Figure 1: Effect of Switching to Semesters on Internship Participation: Individual-by-Year Level Analysis

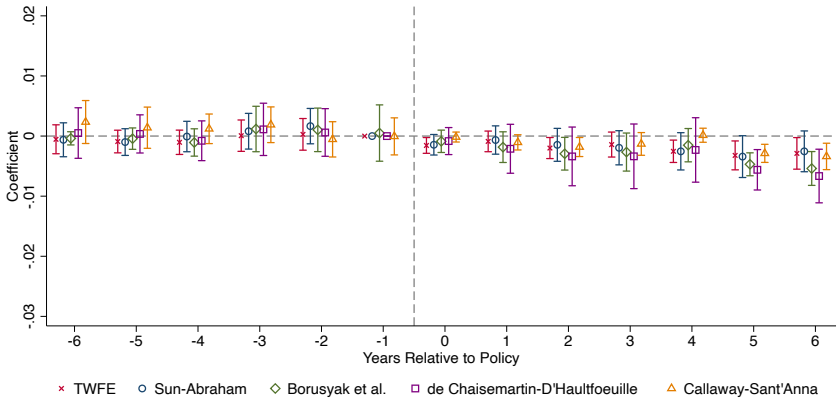
(a) TWFE Estimators



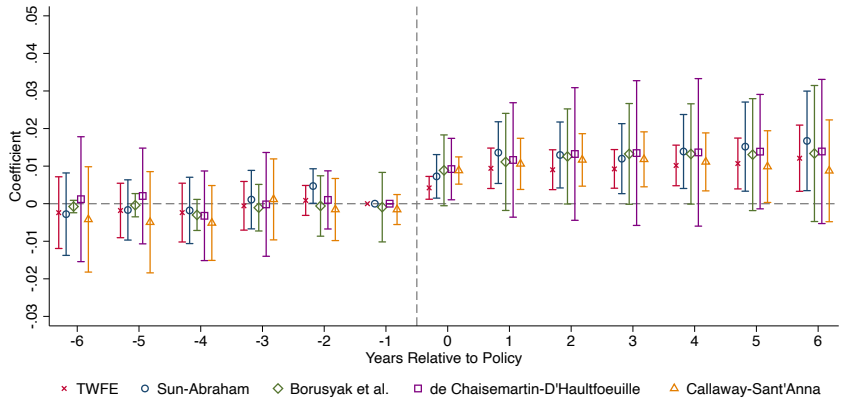
(b) Robust Estimators: Summer Internship



(c) Robust Estimators: Off-Cycle Internship

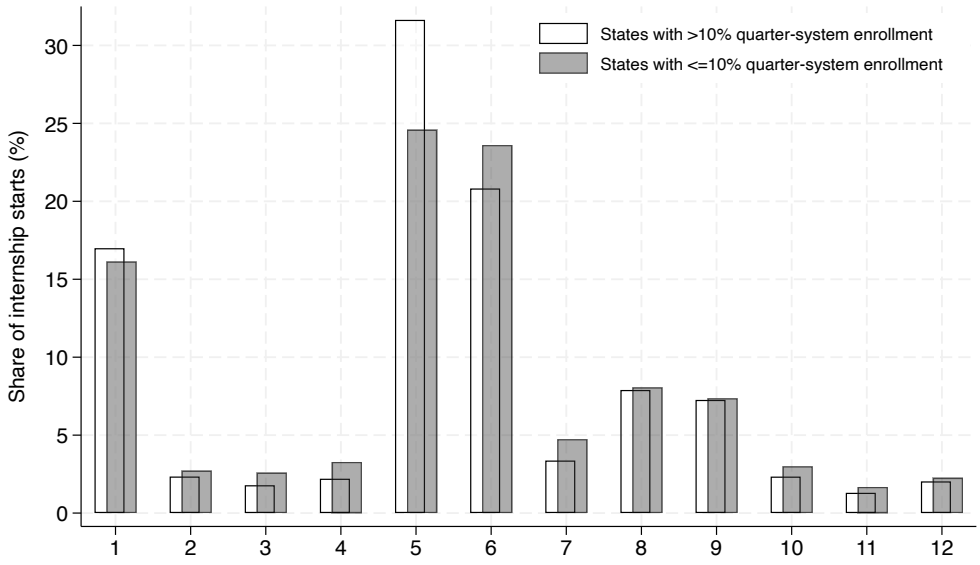


(d) Robust Estimators: Any Internship



Notes: Sub-figure (a) presents the estimated coefficients, θ_k, of equation (1). The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. Sub-figures (b)-(d) overlay the event-study plots constructed using five different estimators for the three outcomes: the staggered TWFE model (equation 1), Sun and Abraham (2021), Borusyak et al. (2024), De Chaisemartin and d'Haultfoeuille (2024), and Callaway and Sant'Anna (2021). All specifications control for institution and year fixed effects, along with group-specific linear time trends. I normalize the coefficients to zero in the year immediately preceding the switch to semester systems. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level. For Borusyak et al. (2024), I conduct a two-step estimation. I regress the outcome variable on group-specific linear time trends, institution, and year fixed effects, and I use the residuals for the event study analysis.

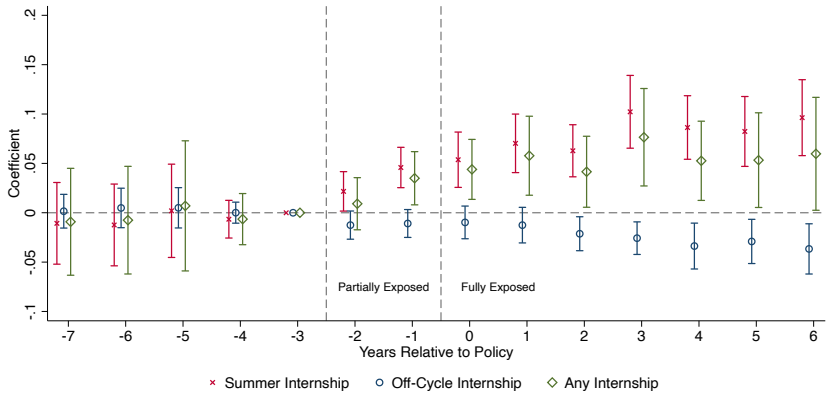
Figure 2: Internship Start Month Distribution: Low vs. High Quarter-System Presence States



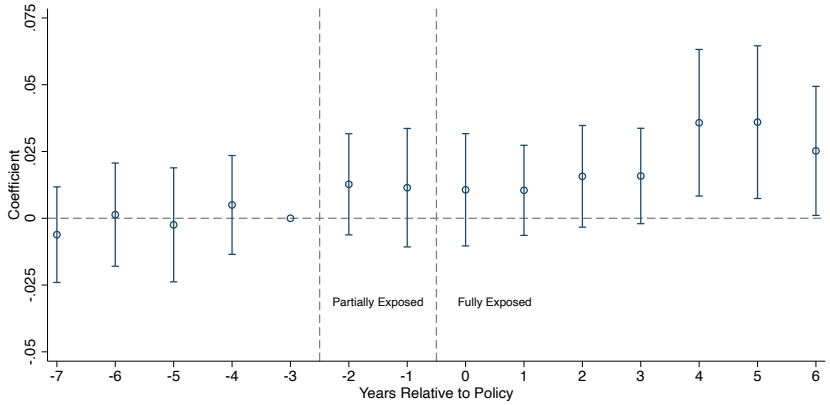
This figure presents the distribution of internship start months for internships held between 2000 and 2019, separately for states with non-trivial quarter-system presence (at least 10% of undergraduates enrolled in quarter-system institutions) and states with low quarter-system presence (no more than 10% of undergraduates enrolled in quarter-system institutions). The sample includes all internships reported on LinkedIn by colleges students. The quarter-system presence of each state is measured using fall 2012 enrollment data from IPEDS, consistent with the classification used in Table 1.

Figure 3: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis

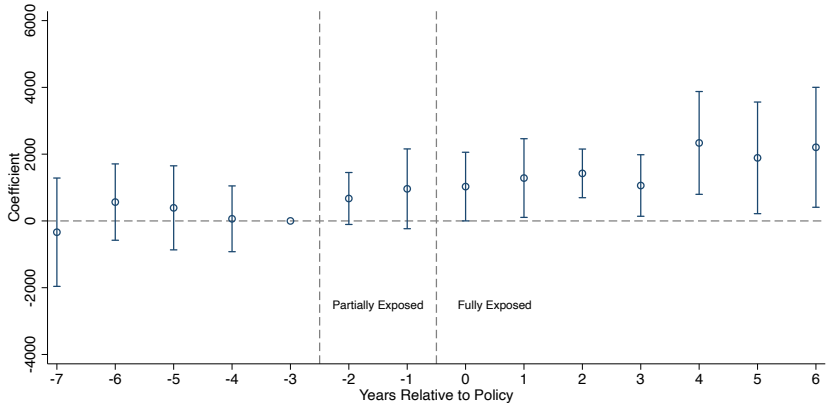
(a) Internship Participation



(b) Non-Entry-Level Job



(c) Starting Salary (in 2010 Dollars)



Notes: This figure presents the estimated coefficients of equation (1) but at the individual level. The outcome variables in sub-figure (a) are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. The outcome variable in sub-figure (b) is whether the student has a non-entry-level first job after college. The outcome variable in sub-figure (c) is the imputed starting salary in 2010 dollars. All specifications control for institution and year fixed effects, along with group-specific linear time trends. I normalize the coefficients to zero for the cohort that enter college three years prior to the switch. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level.

Table 1: Effect of Switching to Semesters on Internship Participation: Individual-by-Year Level Analysis

	Summer Internship		Off-Cycle Internship		Any Internship	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Baseline Specification						
Semester	0.0116**	0.0117**	-0.0014	-0.0012	0.0098*	0.0100*
	(0.0044)	(0.0044)	(0.0011)	(0.0010)	(0.0049)	(0.0049)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.042	0.042	0.014	0.014	0.053	0.053
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765
Panel B: Internships in States with $>10\%$ of Undergraduates in Quarter-System Institutions						
Semester	0.0004	0.0005	-0.0003	-0.0003	0.0002	0.0002
	(0.0011)	(0.0011)	(0.0002)	(0.0002)	(0.0011)	(0.0011)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.005	0.005	0.001	0.001	0.006	0.006
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765
Panel C: Internships in States with $\leq 10\%$ of Undergraduates in Quarter-System Institutions						
Semester	0.0029**	0.0030**	-0.0003	-0.0003	0.0026**	0.0027**
	(0.0011)	(0.0011)	(0.0002)	(0.0002)	(0.0012)	(0.0012)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.009	0.009	0.002	0.002	0.011	0.011
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765
Panel D: Internships in Ohio						
Semester	0.0065***	0.0067***	-0.0009	-0.0008	0.0056**	0.0059**
	(0.0021)	(0.0023)	(0.0008)	(0.0008)	(0.0026)	(0.0027)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.025	0.025	0.010	0.010	0.034	0.034
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765
Panel E: Internships Outside the United States						
Semester	0.0019**	0.0017**	-0.0000	-0.0000	0.0019**	0.0016**
	(0.0008)	(0.0006)	(0.0001)	(0.0001)	(0.0008)	(0.0006)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.003	0.003	0.000	0.000	0.003	0.003
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765

Notes: This table presents the estimates of equation (2). The sample includes undergraduate students enrolled in the 17 institutions between 1990 and 2019. The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. All regressions control for institution and year fixed effects, along with group-specific linear time trends. Columns (2), (4), and (6) additionally controls for students' gender, race and ethnicity, as well as their fields of study in college. Panel B limits internships to those in states where more than 10% of undergraduate students are enrolled in quarter-system institutions. Panel C limits internships to those in states where no more than 10% of undergraduate students are enrolled in quarter-system institutions. Panel D limits internships to those in Ohio. Panel E is limited to internships outside the U.S. The share of undergraduate students enrolled in quarter-system institutions is based on fall 2012 data. States where over 10% of undergraduates attended quarter-system institutions in 2012 include Oregon, Washington, Arizona, California, Utah, Illinois, Rhode Island, Delaware, Michigan, Georgia, Florida, New Hampshire, and Nevada. The standard errors are clustered at the institution level. Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table 2: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Partial	0.034*	-0.010	0.025	0.008*	508.033
	(0.018)	(0.006)	(0.021)	(0.004)	(364.543)
Full	0.068**	-0.014*	0.054*	0.012***	845.645**
	(0.023)	(0.008)	(0.027)	(0.003)	(315.569)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.250	0.089	0.339	0.548	54966.181
N	255,441	255,441	255,441	255,441	255,441

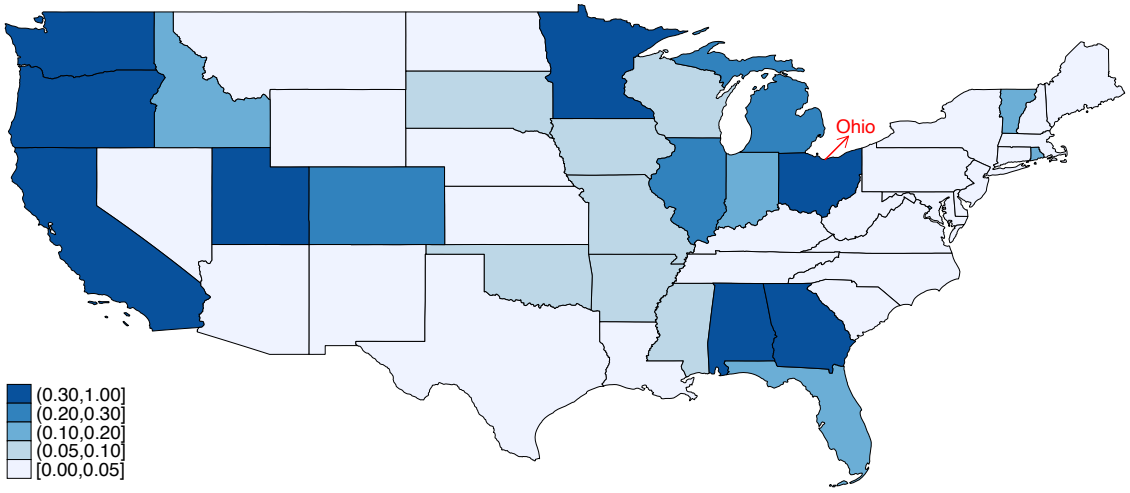
Notes: This table presents the estimates of equation (3). The sample includes college students who entered 17 institutions in Ohio between 1990 and 2015. I exclude students who spent fewer than four years or more than six years in college, those without information on their first job after college, and students from Antioch University due to its small sample size. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

ONLINE APPENDIX

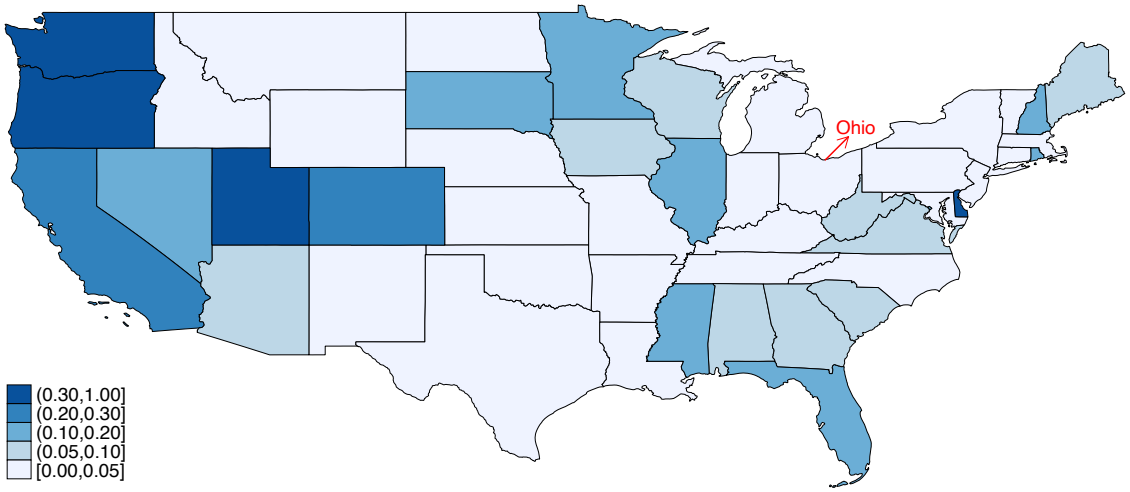
A Additional Figures and Tables

Figure A1: Share of Colleges and Universities Operating under Quarter Systems by State

(a) 1995

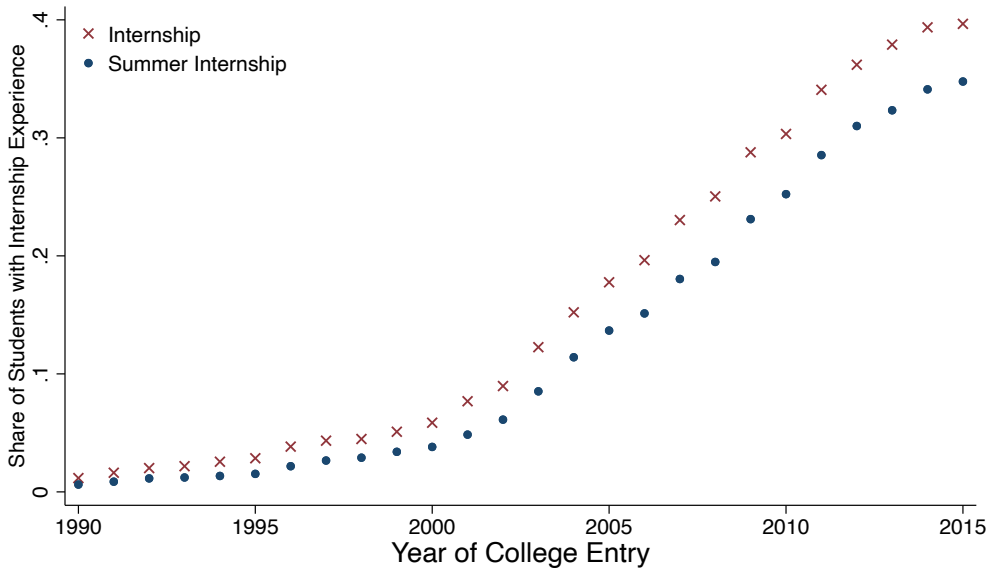


(b) 2019



Notes: This figure shows the share of colleges and universities operating under quarter systems by state in 1995 (a) and 2019 (b). The sample includes degree-granting institutions at the baccalaureate level or higher. Alaska and Hawaii are excluded from the map.

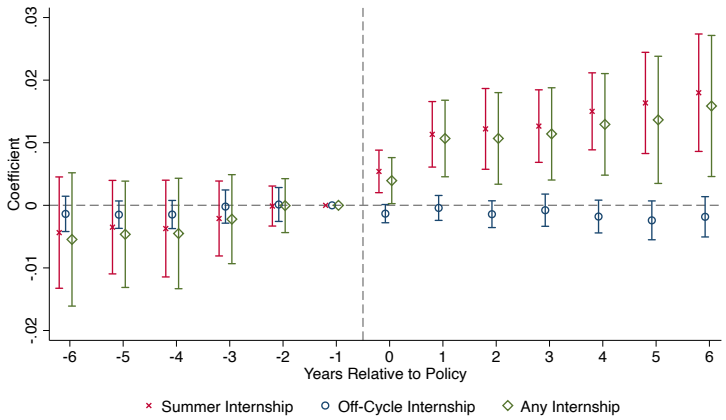
Figure A2: Share of Students with Internship Experience by Year of College Entry



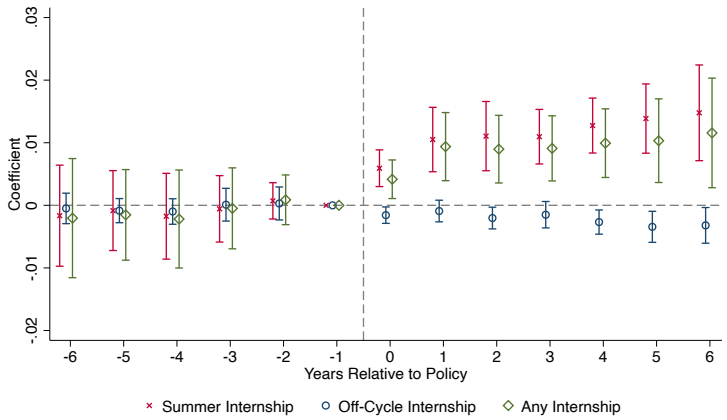
Notes: This figure presents the share of students with at least one internship and at least one summer internship during their years of college enrollment, by year of college entry. The sample includes students who entered 17 institutions in Ohio between 1990 and 2015. I exclude students who spent fewer than four or more than six years in college.

Figure A3: Effect of Switching to Semesters on Internship Participation: Individual-by-Year Level Analysis

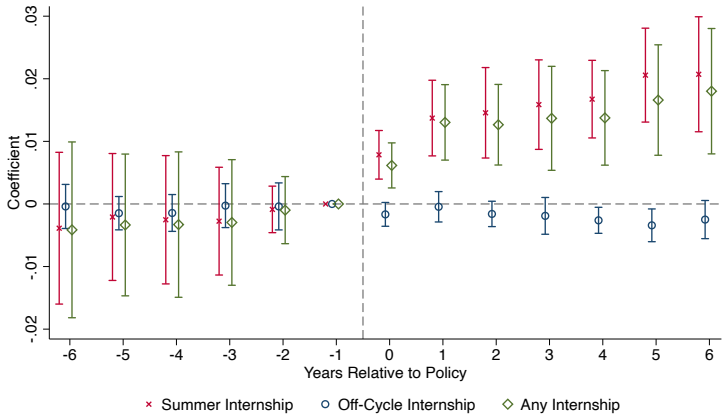
(a) No Group-Specific Linear Trend



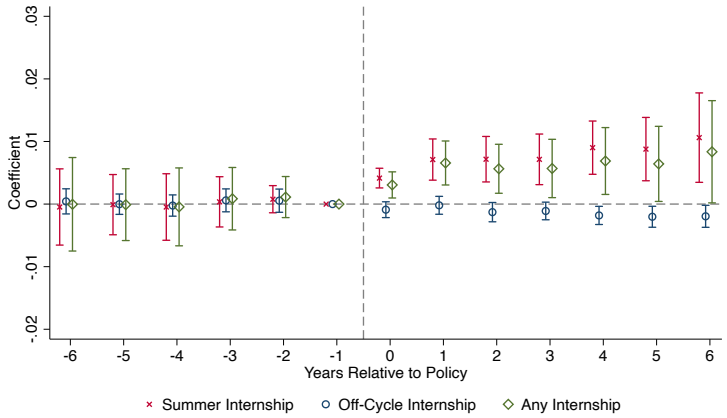
(b) Institution-Specific Linear Trend



(c) Excluding the First and Fifth or Later Calendar Years of Enrollment



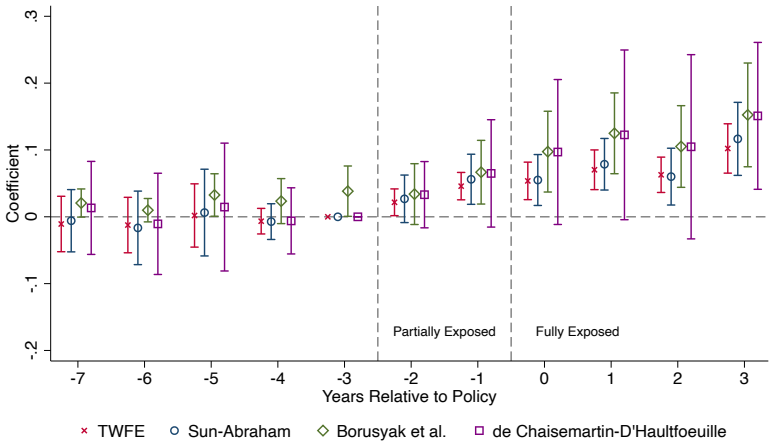
(d) Including Graduate Students



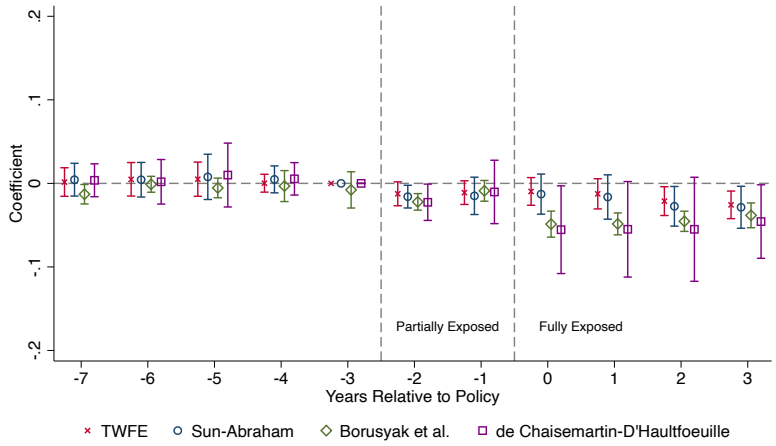
Notes: This figure presents the estimated coefficients, θ_k, of equation (1). The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. All specifications control for institution and year fixed effects, along with group-specific linear time trends for sub-figures (c) and (d). I normalize the coefficients to zero in the year immediately preceding the switch to semester systems. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level. Sub-figure (a) does not control for the group-specific linear time trend. Sub-figure (b) controls for the institution-specific linear time trends. Sub-figure (c) excludes the first and fifth or later calendar years of enrollment. Sub-figure (d) includes both undergraduate and graduate students in the sample.

Figure A4: Effect of Switching to Semesters on Internship Participation: Individual Level Analysis, Robust Estimators

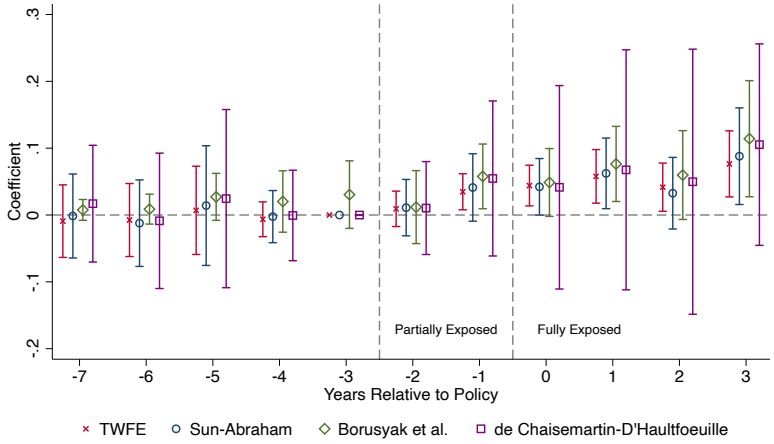
(a) Robust Estimators: Number of Summer Internships



(b) Robust Estimators: Number of Off-Cycle Internships



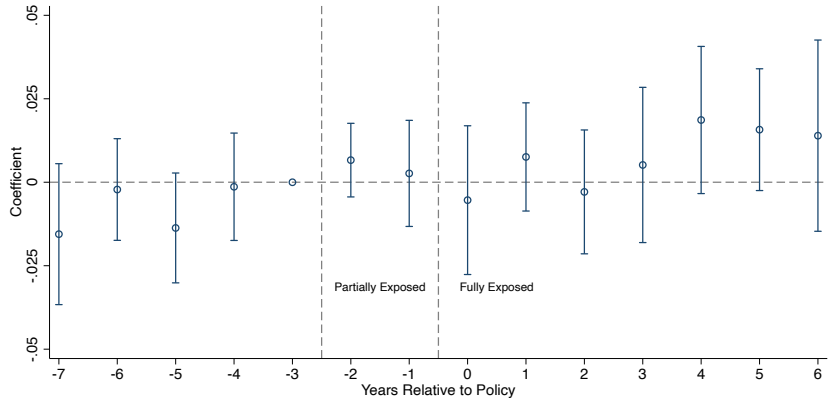
(c) Robust Estimators: Number of Internships



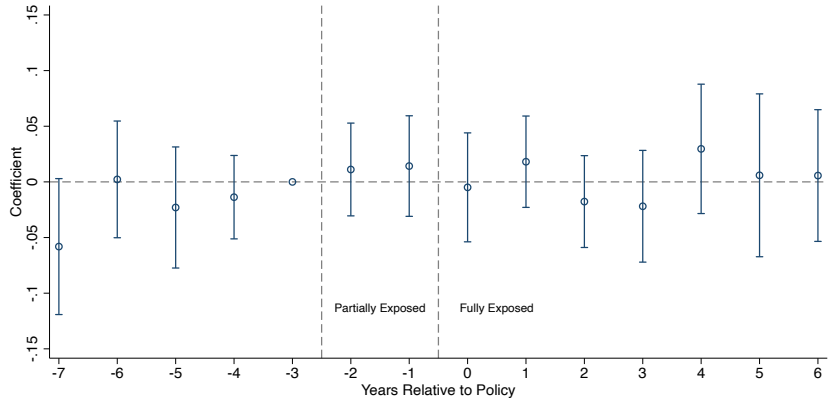
Notes: This figure overlays the event-study plots constructed using different estimators for the following outcomes: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, and (3) the total number of internships undertaken throughout college. The estimators include the staggered TWFE model, Sun and Abraham (2021), Borusyak et al. (2024), and De Chaisemartin and d'Haultfoeuille (2024). All specifications control for institution and year fixed effects, along with group-specific linear time trends. I normalize the coefficients to zero for the cohort that enter college three years prior to the switch. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level.

Figure A5: Effect of Switching to Semesters on Medium-Term Outcomes: Individual-by-Year Level Analysis

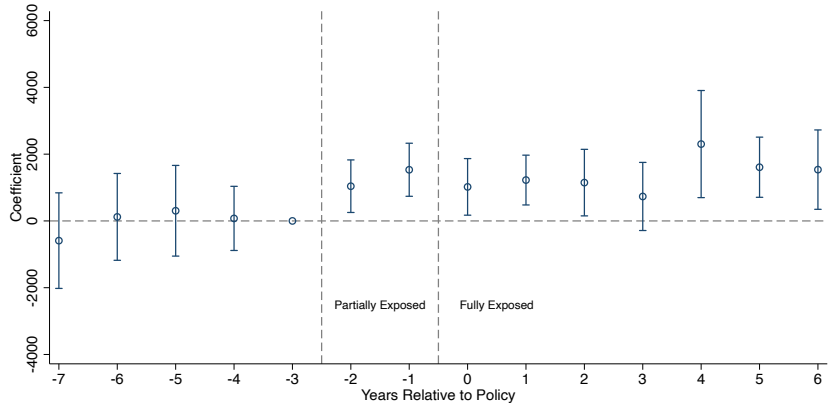
(a) Non-Entry-Level Job



(b) Job Seniority



(c) Imputed Salary (in 2010 Dollars)



Notes: This figure presents the estimated coefficients of equation (1) but at the individual level. It tracks students' employment positions eight years after college entry. The outcome variable in sub-figure (a) is an indicator for whether the student holds a non-entry-level job at that time. The outcome variable in sub-figure (b) is the seniority level on a 7-point scale. The outcome variable in sub-figure (c) is the imputed salary in 2010 dollars. All specifications control for institution and year fixed effects, along with group-specific linear time trends. I normalize the coefficients to zero for the cohort that enter college three years prior to the switch. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level.

Table A1: Year of Switch to Semesters

Institution	Year
Hiram College	1996
Baldwin Wallace University	1998
University of Toledo	1998
Bluffton University	1999
Cleveland State University	1999
Youngstown State University	2000
Cedarville University	2002
Central State University	2005
University of Dayton	2005
Shawnee State University	2007
Otterbein University	2011
Ohio State University	2012
Ohio University	2012
University of Cincinnati	2012
Wright State University	2012
Antioch University	2013
Franklin University	–

Notes: This table presents the 17 colleges and universities in Ohio that are included in the analysis sample, along with the academic year in which they transitioned from quarter to semester systems.

Table A2: Summary Statistics

Variable	Mean	Std Dev	Num of Obs
Panel A: Student Characteristics			
Female	0.488	0.500	407,517
White	0.855	0.352	407,517
Black	0.086	0.281	407,517
Asian Pacific Islander	0.039	0.193	407,517
Hispanic	0.018	0.132	407,517
Duration of Study: $<$ 4 yrs	0.242	0.428	407,517
Duration of Study: 4 yrs	0.501	0.500	407,517
Duration of Study: 5 yrs	0.199	0.399	407,517
Duration of Study: 6 yrs	0.038	0.191	407,517
Duration of Study: $>$ 6 yrs	0.019	0.138	407,517
Field of Study: Biz & Econ	0.261	0.439	407,517
Field of Study: Engineering	0.141	0.348	407,517
Field of Study: Other	0.598	0.490	407,517
Panel B: Internship Uptake			
Number of Internships: Summer	0.207	0.566	407,517
Number of Internships: Off-Cycle	0.075	0.309	407,517
Number of Internships	0.282	0.704	407,517
Panel C: Post-Graduation Outcomes			
Enrollment in Advanced Degree Program in 1 Year	0.146	0.353	407,517
Enrollment in Advanced Degree Program in 3 Years	0.205	0.404	407,517
Enrollment in Advanced Degree Program at Any Time	0.338	0.473	407,517
Enrollment in Doctorate Degree Program at Any Time	0.070	0.255	407,517
Gap to 1st Job (in Months)	22.545	39.602	342,345
Starting Salary (in Thousands, 2010 Dollars)	54.788	25.801	342,345
Non-Entry Level	0.549	0.498	342,345
Occupation: Biz & Mgmt	0.242	0.428	342,345
Occupation: Eng & Math	0.151	0.358	342,345
Occupation: Sales & Adm	0.166	0.372	342,345
Occupation: Education	0.086	0.280	342,345
Occupation: Healthcare	0.074	0.262	342,345

Notes: This table presents the mean, standard deviation, and number of observations for the key variables. The sample includes college students who entered 17 institutions in Ohio between 1990 and 2015.

Table A3: Effect of Switching to Semesters on LinkedIn Usage: Entering Cohort Level Analysis

	Share with LinkedIn Profiles		Share with First Job Details		Share with Updates Since '23		Avg Number of Connections	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Partial	-0.001	-0.006	0.001	-0.004	0.005	-0.000	0.816	1.481
	(0.022)	(0.019)	(0.019)	(0.017)	(0.010)	(0.005)	(18.790)	(18.313)
Full	0.013	-0.023	0.010	-0.020	0.001	0.002	-2.566	0.169
	(0.025)	(0.027)	(0.021)	(0.022)	(0.007)	(0.006)	(15.531)	(16.666)
Group-Specific Trend	x	x	x	x	x	x	x	x
Weight by Avg Cohort Size		x		x		x		x
Mean(Y)	0.387	0.470	0.323	0.393	0.889	0.885	224.939	251.568
N	225	225	225	225	225	225	225	225

Notes: This table presents the TWFE estimates of the effect of switching to semesters on students' LinkedIn usage. I consider a cohort as fully exposed to the semester system if they enter college in the year of or after the transition to semester systems. I consider a cohort as partially exposed if they enter college one or two years before the transition. The sample includes entering cohorts of undergraduate students from 2000 to 2015, excluding Antioch University and Franklin University due to their small cohort sizes. To measure students' LinkedIn usage by each institution's entering cohort, I calculate the share of college graduates who have LinkedIn profiles (columns (1) and (2)) and those who provide detailed information about their first employment after college (columns (3) and (4)). The denominator is the number of full-time, first-time, degree-seeking undergraduate students in each entering cohort from 2000 to 2015, as obtained from IPEDS. The outcomes in columns (5) and (6) are the share of college graduates who have updated their profiles since 2023, conditional on having a public LinkedIn profile, while the outcomes in columns (7) and (8) are the average number of LinkedIn connections. In columns (2), (4), (6), and (8), observations are weighted by the average size of the entering cohorts at each institution. All regressions control for institution and year fixed effects, as well as group-specific linear time trends. Standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A4: Effect of Switching to Semesters on Students' Characteristics: Individual Level Placebo Analyses

	(1) Female	(2) Minority	(3) Biz & Econ	(4) Engineering	(5) Other Majors
Partial	-0.002	-0.001	-0.001	0.012	-0.011
	(0.005)	(0.006)	(0.010)	(0.008)	(0.008)
Full	0.007	0.011*	0.006	0.005	-0.011
	(0.008)	(0.006)	(0.010)	(0.009)	(0.015)
Group-Specific Trend	x	x	x	x	x
Mean(Y)	0.475	0.132	0.249	0.164	0.587
N	255,441	255,441	255,441	255,441	255,441

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) whether the student is female, (2) whether the student is a racial minority, (3) whether the student studies business and economics majors, (4) whether the student studies engineering majors, and (5) whether the student studies majors other than business, economics, or engineering. All regressions control for institution and year fixed effects, and group-specific linear time trends. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A5: Effect of Switching to Semesters on Summer Internship Participation: Individual-by-Year Level Analysis, by Industry of Internship Companies

	(1) Information	(2) Finance	(3) Professional, Scientific Services	(4) Manufacturing	(5) Education	(6) Healthcare	(7) Publicly Listed
Semester	0.0011***	0.0017**	0.0015**	0.0006	0.0007**	0.0003	0.0018
	(0.0003)	(0.0006)	(0.0006)	(0.0011)	(0.0003)	(0.0002)	(0.0012)
Group-Specific Trend	x	x	x	x	x	x	x
Student Characteristics	x	x	x	x	x	x	x
Mean(Y)	0.0023	0.0034	0.0040	0.0074	0.0022	0.0016	0.0071
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765

Notes: This table presents the estimates of equation (2). The sample includes undergraduate students enrolled in the 17 institutions between 1990 and 2019. The outcome variables are the industries of the summer internship companies, classified using NAICS codes provided by Revelio Labs. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A6: Effect of Switching to Semesters on Internship Participation: Individual-by-Year Level Analysis, Robustness

	Summer Internship		Off-Cycle Internship		Any Internship	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: No Group-Specific Linear Trend						
Semester	0.0178**	0.0177***	-0.0003	-0.0001	0.0167**	0.0168**
	(0.0062)	(0.0060)	(0.0016)	(0.0015)	(0.0072)	(0.0069)
Group-Specific Trend						
Student Characteristics		x		x		x
Mean(Y)	0.042	0.042	0.014	0.014	0.053	0.053
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765
Panel B: Institution-Specific Linear Trend						
Semester	0.0114**	0.0115**	-0.0015	-0.0014	0.0096*	0.0098*
	(0.0044)	(0.0044)	(0.0012)	(0.0011)	(0.0050)	(0.0050)
Institution-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.042	0.042	0.014	0.014	0.053	0.053
N	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765	2,356,765
Panel C: Excluding the First and Fifth or Later Calendar Years of Enrollment						
Semester	0.0164**	0.0165**	-0.0010	-0.0009	0.0148**	0.0150**
	(0.0062)	(0.0062)	(0.0013)	(0.0012)	(0.0068)	(0.0067)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.055	0.055	0.016	0.016	0.067	0.067
N	1,357,581	1,357,581	1,357,581	1,357,581	1,357,581	1,357,581
Panel D: Including Graduate Students						
Semester	0.0073*	0.0074*	-0.0013	-0.0013	0.0056	0.0058
	(0.0035)	(0.0036)	(0.0009)	(0.0008)	(0.0041)	(0.0041)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.033	0.033	0.012	0.012	0.042	0.042
N	4,215,816	4,215,816	4,215,816	4,215,816	4,215,816	4,215,816

Notes: This table presents the estimates of equation (2). The sample includes undergraduate students enrolled in the 17 institutions between 1990 and 2019. The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. All regressions control for institution and year fixed effects, along with group-specific linear time trends for Panels C and D. Columns (2), (4), and (6) additionally controls for students' gender, race and ethnicity, as well as their fields of study in college. Panel A does not control for the group-specific linear time trend. Panel B controls for institution-specific linear time trend. Panel C excludes each student's first and fifth or later calendar years of enrollment. Panel D includes both undergraduate and graduate students in the sample. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A7: Effect of Switching to Semesters on Summer Internship Participation: Individual-by-Year Level Analysis, Separately for Summers Following Years 1, 2, and 3

	Summer After Year 1		Summer After Year 2		Summer After Year 3	
	(1)	(2)	(3)	(4)	(5)	(6)
Semester	0.0095***	0.0094***	0.0148**	0.0148**	0.0212**	0.0214**
	(0.0028)	(0.0028)	(0.0066)	(0.0068)	(0.0073)	(0.0073)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.019	0.019	0.050	0.050	0.088	0.088
N	308,836	308,836	308,836	308,836	308,836	308,836

Notes: This table presents the estimates of equation (2). The sample includes college students who entered 17 institutions in Ohio between 1990 and 2015. I exclude students who spent fewer than four years, and students from Antioch University due to its small sample size. The outcome variables are as follows: (1) whether the student has an internship in the summer after their first year in college; (2) whether the student has an internship in the summer after their second year in college; and (3) whether the student has an internship in the summer after their third year in college. All regressions control for institution and year fixed effects, along with group-specific linear time trends. Columns (2), (4), and (6) additionally controls for students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.

Table A8: Effect of Switching to Semesters on Summer Internship Participation: Individual-by-Year Level Analysis, Excluding the Institutions Ever Under the 4-1-4 System or Trimester System

	Summer Internship		Off-Cycle Internship		Any Internship	
	(1)	(2)	(3)	(4)	(5)	(6)
Semester	0.0116**	0.0118**	-0.0022*	-0.0020*	0.0091	0.0094
	(0.0047)	(0.0047)	(0.0011)	(0.0010)	(0.0053)	(0.0053)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.042	0.042	0.015	0.015	0.054	0.054
N	2,125,103	2,125,103	2,125,103	2,125,103	2,125,103	2,125,103

Notes: This table presents the estimates of equation (2). The sample excludes Otterbein University, which used the 4-1-4 system between 2011 and 2014, Franklin University, which remained on the trimester system from 1984 to 2022, and University of Dayton, which used the trimester system from 1990 to 2004. The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. All regressions control for institution and year fixed effects, along with group-specific linear time trends. Columns (2), (4), and (6) additionally controls for students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A9: Effect of Switching to Semesters on Summer and Off-Cycle Internship Participation: Individual-by-Year Level Analysis

	(1) Summer Only	(2) Off-Cycle Only	(3) Both	(4) Neither
Semester	0.0112**	-0.0017*	0.0004	-0.0100*
	(0.0044)	(0.0010)	(0.0003)	(0.0049)
Group-Specific Trend	x	x	x	x
Student Characteristics	x	x	x	x
Mean(Y)	0.039	0.012	0.003	0.947
N	2,356,765	2,356,765	2,356,765	2,356,765

Notes: This table presents the estimates of equation (2). The sample includes college students who entered 17 institutions in Ohio between 1990 and 2015. The outcome variables are: (1) whether the student participates in a summer internship but not an off-cycle internship; (2) whether the student participates in an off-cycle internship but not a summer internship; (3) whether the student participates in both summer and off-cycle internships; and (4) whether the student participates in neither a summer nor an off-cycle internship. All regressions control for institution and year fixed effects, group-specific linear time trends, and students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A10: Effect of Switching to Semesters on Internship Earnings: Individual Level Analysis

	(1) Summer	(2) Off-Cycle	(3) Total
Partial	350.540	-177.283	173.256
	(326.644)	(156.429)	(411.766)
Full	1050.608**	-319.885*	730.723
	(436.485)	(172.446)	(573.406)
Group-Specific Trend	x	x	x
Student Characteristics	x	x	x
Mean(Y)	5285.703	2330.392	7616.094
N	255,441	255,441	255,441

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are the total earnings from internships undertaken throughout college that are (1) summer internships, (2) off-cycle internships, and (3) both types combined. Earnings are calculated based on the imputed monthly salary for the internships and their duration. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A11: Effect of Switching to Semesters on Occupation of the First Job: Individual Level Analysis

	(1) Biz & Mgmt	(2) Eng & Math	(3) Sales & Adm	(4) Education	(5) Healthcare
Partial	0.012***	-0.000	0.000	0.002	-0.002
	(0.003)	(0.002)	(0.004)	(0.002)	(0.003)
Full	0.011**	0.008**	0.002	-0.001	-0.003
	(0.004)	(0.003)	(0.004)	(0.002)	(0.003)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.238	0.164	0.161	0.087	0.066
N	255,441	255,441	255,441	255,441	255,441

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables include whether their first job is in the occupation of business and management, engineering and mathematics, sales and administration, education, or healthcare. The occupation is defined by the first two digits of the O*NET code. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A12: Effect of Switching to Semesters on First Job Match in Internship's Company, Industry, and Occupation: Individual Level Analysis

	Same Company		Same Industry		Same Occupation	
	(1)	(2)	(3)	(4)	(5)	(6)
Partial	0.001	0.001	0.002	0.001	0.005	0.004
	(0.002)	(0.002)	(0.005)	(0.005)	(0.006)	(0.006)
Full	0.007**	0.007*	0.009	0.009	0.009	0.009
	(0.003)	(0.004)	(0.005)	(0.006)	(0.007)	(0.007)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.045	0.045	0.075	0.075	0.116	0.116
N	255,441	255,441	255,441	255,441	255,441	255,441

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are whether the first job after graduation is in the same company, industry, and occupation as at least one internship. The occupation is defined by the first two digits of the O*NET code, and the industry is defined by the first two digits of the NAICS industry code. All regressions control for institution and year fixed effects, along with group-specific linear time trends. Columns (2), (4), and (6) additionally controls for students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A13: Effect of Switching to Semesters on Skill Accumulation: Individual Level Analysis

	(1) Any	(2) Number	(3) Hard	(4) Soft	(5) Practical	(6) Research
Partial	-0.004	-0.022	0.008	-0.027	-0.018	-0.000
	(0.008)	(0.150)	(0.153)	(0.058)	(0.143)	(0.018)
Full	0.016*	0.300*	0.170	0.127**	0.301*	-0.004
	(0.009)	(0.142)	(0.132)	(0.058)	(0.147)	(0.027)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics	x	x	x	x	x	x
Mean(Y)	0.618	10.667	9.146	1.494	9.946	0.694
N	255,441	255,441	255,441	255,441	255,441	255,441

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) whether the student reports any skills on their LinkedIn profile, (2) the total number of self-reported skills, (3) the number of hard skills, (4) the number of soft skills, (5) the number of practical skills, and (6) the number of research skills. All regressions control for institution and year fixed effects, along with group-specific linear time trends. Columns (2), (4), and (6) additionally controls for students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A14: Effect of Switching to Semesters on Gap to the First Job and Enrollment in Advanced Degrees: Individual Level Analyses

	Gap to 1st Job	Enrollment in Advanced Degree			Doctorate
	(1)	(2)	(3)	(4)	(5)
	In Months	In 1 Year	In 3 Years	Ever	Ever
Partial	0.560	0.007	0.006	0.001	-0.004
	(0.409)	(0.006)	(0.007)	(0.005)	(0.003)
Full	-0.125	-0.000	-0.001	0.003	-0.006
	(0.393)	(0.006)	(0.006)	(0.007)	(0.004)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	21.385	0.154	0.217	0.335	0.072
N	255,442	300,911	300,911	300,911	300,911

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. I include students without information on their first job after college for columns (2)–(5). The outcome variables are (1) the gap between college graduation and the first job in months, (2) whether students enroll in advanced degree programs within one year of college graduation, (3) within three years of college graduation, (4) ever, and (5) whether they ever enroll in doctorate degree programs. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A15: Effect of Switching to Semesters on Participation in Non-Internship Positions: Individual Level Analysis

	Any Non-Intern Jobs		Number of Non-Intern Jobs		Duration of Non-Intern Jobs	
	(1)	(2)	(3)	(4)	(5)	(6)
Partial	-0.000	-0.001	-0.012	-0.013	-0.309	-0.285
	(0.009)	(0.010)	(0.018)	(0.019)	(0.449)	(0.463)
Full	0.016	0.017	0.037	0.037	0.239	0.285
	(0.014)	(0.015)	(0.025)	(0.026)	(0.568)	(0.576)
Group-Specific Trend	x	x	x	x	x	x
Student Characteristics		x		x		x
Mean(Y)	0.359	0.359	0.649	0.649	12.855	12.855
N	255,441	255,441	255,441	255,441	255,441	255,441

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables include whether students have any non-internship jobs while in college, as well as the total number and duration of these jobs. The first and final calendar years, during which they are not enrolled for the full year, are excluded. Examples of non-internship jobs include positions such as teaching and research assistants, peer mentoring and private tutoring roles, and co-op positions. All regressions control for institution and year fixed effects, along with group-specific linear time trends. Columns (2), (4), and (6) additionally controls for students' gender, race and ethnicity, as well as their fields of study in college. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A16: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis, Robustness

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Panel A: No Student Characteristics					
Partial	0.035*	-0.010	0.025	0.011*	693.176
	(0.019)	(0.006)	(0.022)	(0.006)	(405.658)
Full	0.068**	-0.015*	0.054*	0.013**	935.298**
	(0.023)	(0.008)	(0.027)	(0.005)	(359.859)
Group-Specific Trend	x	x	x	x	x
Student Characteristics					
Mean(Y)	0.250	0.089	0.339	0.548	54966.181
N	255,441	255,441	255,441	255,441	255,441
Panel B: Institution-Specific Linear Trend					
Partial	0.034*	-0.010	0.024	0.007*	470.795
	(0.018)	(0.006)	(0.021)	(0.004)	(364.593)
Full	0.066**	-0.015*	0.052*	0.012***	800.886**
	(0.024)	(0.008)	(0.028)	(0.003)	(317.545)
Institution-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.250	0.089	0.339	0.548	54966.181
N	255,441	255,441	255,441	255,441	255,441
Panel C: All Undergraduate Students, Regardless of Duration of Study					
Partial	0.025	-0.006	0.019	0.004	475.482
	(0.016)	(0.005)	(0.020)	(0.005)	(346.655)
Full	0.063**	-0.010	0.053*	0.012**	903.030***
	(0.026)	(0.007)	(0.030)	(0.005)	(284.851)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.219	0.079	0.299	0.549	54779.119
N	342,039	342,039	342,039	342,039	342,039

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, and group-specific linear time trends. Panels B and C control for students' gender, race and ethnicity, as well as their fields of study in college. Panel B controls for institution-specific linear time trends instead of group-specific linear trends. Panel C includes all undergraduate students, regardless of their duration of study. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A17: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis, Heterogeneity by Gender

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Panel A: Male Students					
Partial	0.024	-0.007	0.017	0.004	750.429*
	(0.017)	(0.006)	(0.019)	(0.005)	(416.717)
Full	0.058**	-0.011*	0.048*	0.016**	1009.805***
	(0.025)	(0.005)	(0.025)	(0.006)	(283.468)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.245	0.080	0.325	0.621	59316.599
N	134,071	134,071	134,071	134,071	134,071
Panel B: Female Students					
Partial	0.046**	-0.013*	0.033	0.013**	244.539
	(0.020)	(0.006)	(0.025)	(0.004)	(338.266)
Full	0.079***	-0.018	0.062*	0.009	655.316
	(0.025)	(0.012)	(0.035)	(0.006)	(419.524)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.256	0.099	0.355	0.467	50160.506
N	121,370	121,370	121,370	121,370	121,370

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, group-specific linear time trends, students' race and ethnicity, as well as their fields of study in college. Panel A includes only male students, and Panel B includes only female students. Students' gender are predicted based on their names. The standard errors are clustered at the institution level.

Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A18: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis, Heterogeneity by Race

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Panel A: White Students					
Partial	0.031*	-0.011*	0.020	0.009	546.310
	(0.017)	(0.006)	(0.021)	(0.005)	(418.195)
Full	0.065**	-0.014*	0.050*	0.010***	713.204**
	(0.024)	(0.008)	(0.028)	(0.003)	(275.733)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.245	0.088	0.333	0.548	54978.504
N	221,761	221,761	221,761	221,761	221,761
Panel B: Minority Students					
Partial	0.055*	-0.000	0.055	-0.000	244.519
	(0.027)	(0.011)	(0.033)	(0.014)	(940.069)
Full	0.086***	-0.012	0.073**	0.025	1836.776*
	(0.023)	(0.007)	(0.026)	(0.018)	(967.976)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.284	0.095	0.379	0.546	54885.042
N	33,680	33,680	33,680	33,680	33,680

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. Panel A includes only white students, and Panel B includes black, Hispanic, Asian, and Pacific Islander students. Students' race and ethnicity are predicted based on their names and locations. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

Table A19: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis, Heterogeneity by Fields of Study

	Number of Internships			Post-Graduation Outcomes	
	(1) Summer	(2) Off-Cycle	(3) Any	(4) Non-Entry Level	(5) Starting Salary
Panel A: Business and Economics Majors					
Partial	0.065**	-0.004	0.061**	0.011	931.563*
	(0.025)	(0.013)	(0.025)	(0.012)	(476.598)
Full	0.110***	-0.015	0.095***	0.026**	1730.142***
	(0.020)	(0.019)	(0.023)	(0.010)	(570.555)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.320	0.104	0.424	0.614	57906.151
N	63,623	63,623	63,623	63,623	63,623
Panel B: Engineering Majors					
Partial	0.026	-0.010	0.015	-0.006	-479.725
	(0.023)	(0.008)	(0.025)	(0.007)	(444.519)
Full	0.082***	-0.014**	0.068**	0.010	1215.998*
	(0.024)	(0.006)	(0.024)	(0.011)	(579.836)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.374	0.094	0.468	0.753	66991.335
N	41,922	41,922	41,922	41,922	41,922
Panel C: Other Majors					
Partial	0.029*	-0.011	0.017	0.013*	794.547*
	(0.014)	(0.008)	(0.019)	(0.007)	(430.856)
Full	0.047**	-0.011	0.036	0.009	500.467
	(0.017)	(0.008)	(0.023)	(0.006)	(371.837)
Group-Specific Trend	x	x	x	x	x
Student Characteristics	x	x	x	x	x
Mean(Y)	0.186	0.081	0.267	0.463	50355.197
N	149,896	149,896	149,896	149,896	149,896

Notes: This table presents the estimates of equation (3). See notes under Table 2 for more information on the analysis sample. The outcome variables are as follows: (1) the number of summer internships undertaken throughout college, (2) the number of off-cycle internships undertaken throughout college, (3) the total number of internships undertaken throughout college, (4) finding a non-entry-level job after college, and (5) imputed starting salary in 2010 dollars. All regressions control for institution and year fixed effects, group-specific linear time trends, students' gender, race and ethnicity, as well as their fields of study in college. Panel A includes students who study business and economics majors. Panel B includes students who study engineering majors. Panel C includes students who study majors other than business, economics, or engineering. The standard errors are clustered at the institution level.
Significance levels: *: $p < 0.10$, **: $p < 0.05$, and ***: $p < 0.01$.

B Including "Never-Treated" Universities as a Control Group

All colleges and universities in the main analysis sample transitioned from the quarter to the semester system between 1996 and 2013, except Franklin University, which remained on a trimester system. As an alternative approach to address concerns about heterogeneous treatment effects (Goodman-Bacon, 2021), I include additional universities outside Ohio that used quarter systems throughout the sample period as a control group.

In particular, I focus on Oregon and Washington, two states with a large number of colleges and universities that have long used quarter systems and are comparable to institutions in Ohio. Appendix Table B1 lists the "never-treated" universities from these two states that are included in the analysis sample as the control group. In the new sample, 41.52% of college students are enrolled in universities that used the quarter system throughout the period.

Appendix Figure B1(a) plots the effect of switching to semester systems on internship participation at the individual-by-year level, i.e., the estimated coefficients from equation (1), using this sample with the additional control group. The estimates are quantitatively similar to the baseline effects shown in Figure 1(a). There is no evidence of a pretrend before the transition year, and starting in the year of the switch, students become more likely to participate in summer internships and less likely to participate in off-cycle internships. Appendix Figures B1(b)–(e) plot the estimated coefficients under four alternative specifications: without including group-specific linear trends; with institution-specific linear trends; excluding the first and last calendar years of enrollment; and including graduate students. The estimates are quantitatively similar to, and in some cases slightly larger than, those estimated from the main sample shown in Appendix Figures A3(a)–(d).

Appendix Figure B2 plots the estimated individual-level effects of exposure to semester systems on internship participation and post-college labor market outcomes. When students are exposed to semester systems, they graduate with more summer internships and fewer off-cycle internships, resulting in a net positive effect on the total number of internships. They are also more likely to secure a non-entry-level job and earn a higher starting salary upon graduation. The effects are larger for students who are fully exposed than for those who are only partially exposed. All estimates using this sample with the additional control group are

again quantitatively similar to the baseline estimates plotted in Figure 3.

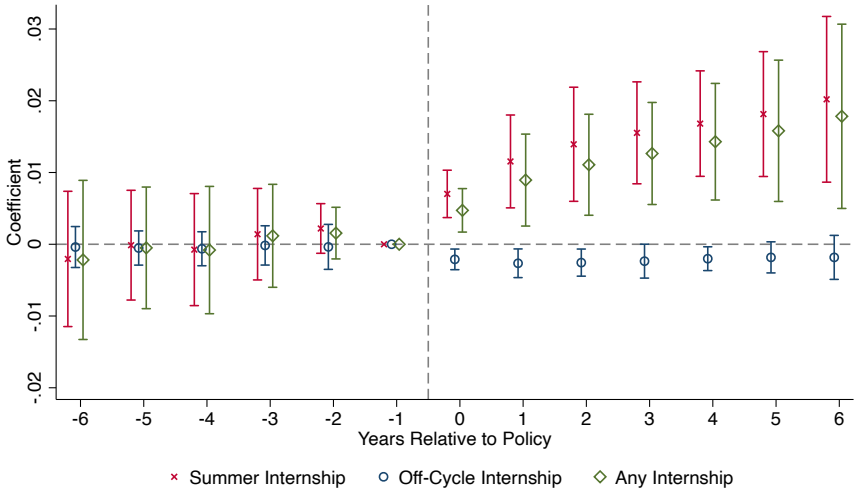
Table B1: List of "Never-Treated" Universities as a Control Group

Institution	State
Eastern Oregon University	OR
Oregon State University	OR
Portland State University	OR
Southern Oregon University	OR
University of Oregon	OR
Western Oregon University	OR
Antioch University Seattle	WA
Central Washington University	WA
City University of Seattle	WA
Eastern Washington University	WA
Seattle Pacific University	WA
Seattle University	WA
The Evergreen State College	WA
University of Washington	WA
Walla Walla University	WA
Western Washington University	WA

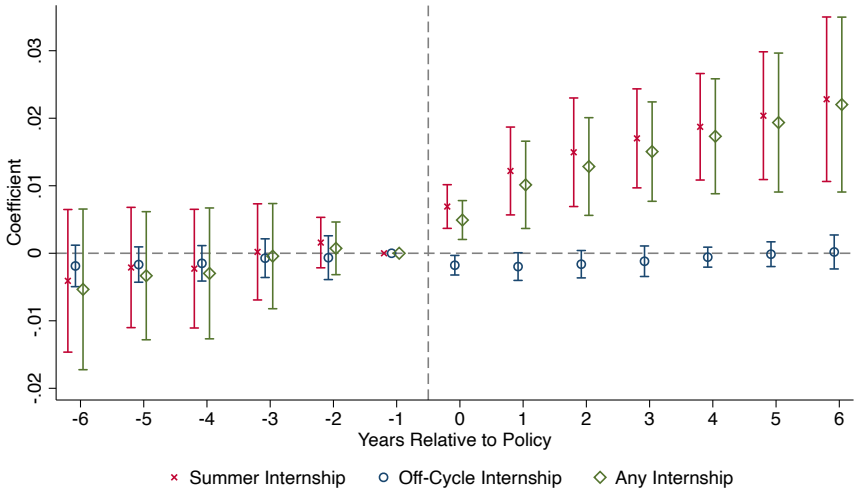
Notes: This table presents the 16 colleges and universities from Oregon and Washington that used the quarter system throughout the sample period and are included in the supplementary analysis.

Figure B1: Effect of Switching to Semesters on Internship Participation: Individual-by-Year Level Analysis

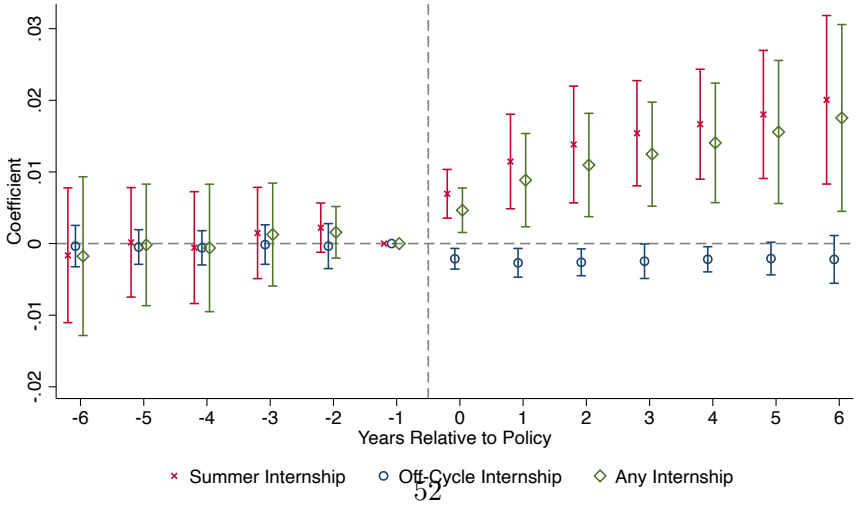
(a) Group-Specific Linear Trend



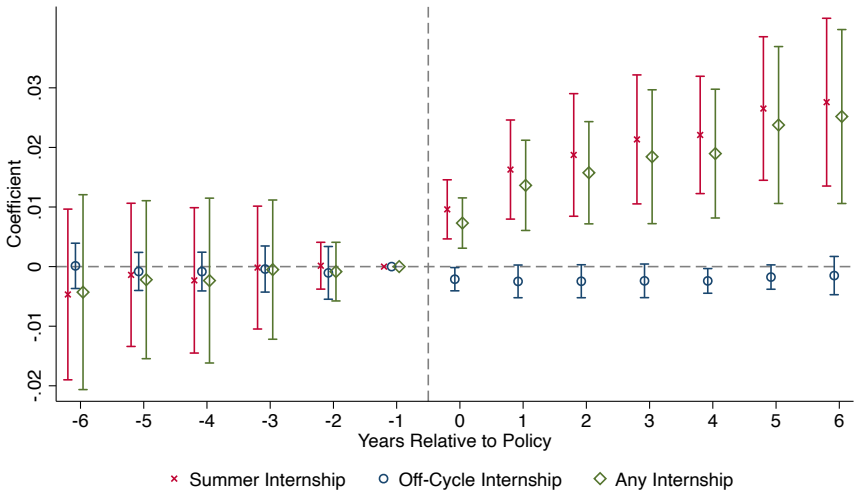
(b) No Group-Specific Linear Trend



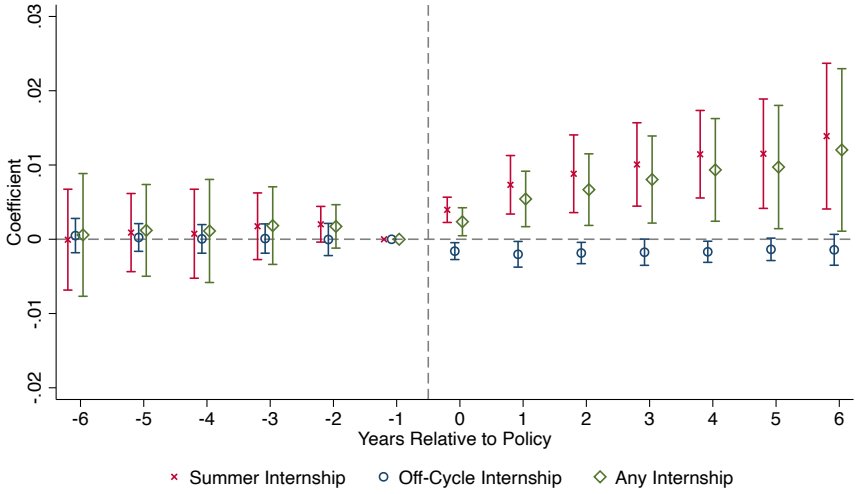
(c) Institution-Specific Linear Trend



(d) Excluding the First and Fifth or Later Calendar Years of Enrollment



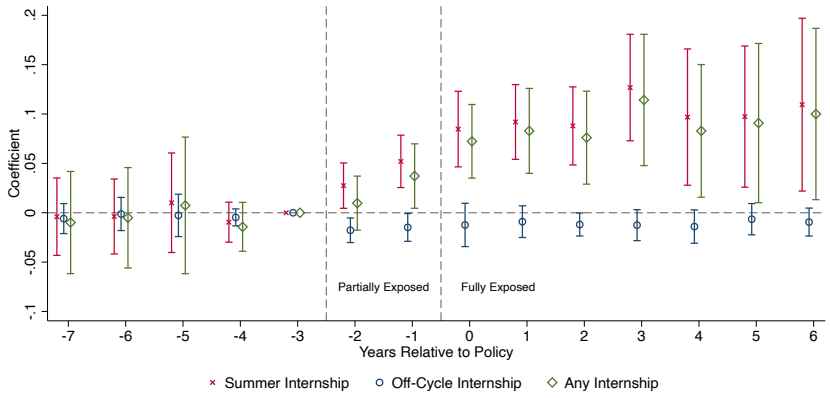
(e) Including Graduate Students



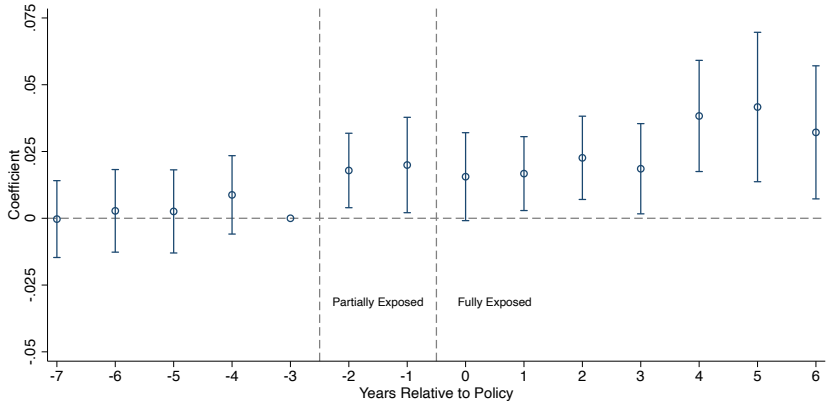
Notes: This figure presents the estimated coefficients, θ_k, of equation (1). The sample includes undergraduate students enrolled in the 17 institutions from Ohio (listed in Appendix Table A1) and 16 institutions from Oregon and Washington (listed in Appendix Table B1) between 1990 and 2019.The outcome variables are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. All specifications control for institution and year fixed effects, along with group-specific linear time trends for sub-figures (a), (d) and (e). I normalize the coefficients to zero in the year immediately preceding the switch to semester systems. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level. Sub-figure (b) does not control for the group-specific linear time trends. Sub-figure (c) controls for the institution-specific linear time trends. Sub-figure (d) excludes the first and fifth or later calendar years of enrollment. Sub-figure (e) includes both undergraduate and graduate students in the sample.

Figure B2: Effect of Switching to Semesters on Internship Participation and Post-Graduation Outcomes: Individual Level Analysis

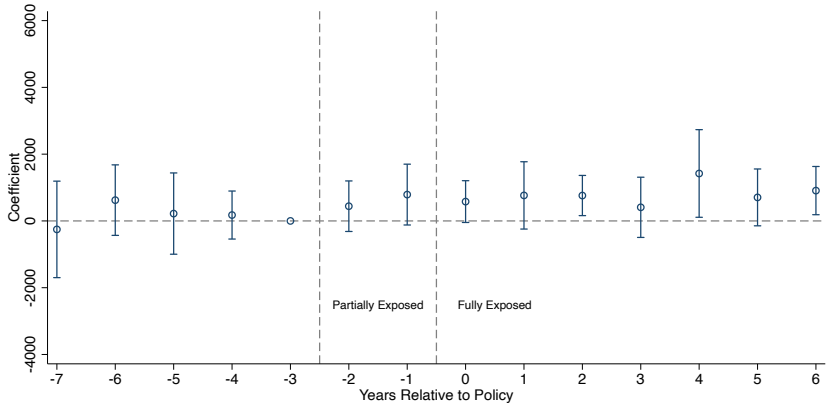
(a) Internship Participation



(b) Non-Entry-Level Job



(c) Starting Salary (in 2010 Dollars)



Notes: This figure presents the estimated coefficients of equation (1) but at the individual level. The sample includes college students who entered 17 institutions in Ohio (listed in Appendix Table A1) and 16 institutions from Oregon and Washington (listed in Appendix Table B1) between 1990 and 2015. I exclude students who spent fewer than four years or more than six years in college and those without information on their first job after college. The outcome variables in sub-figure (a) are as follows: (1) whether the student participates in a summer internship, (2) whether the student participates in an off-cycle internship, and (3) whether the student participates in any internship during the year. The outcome variable in sub-figure (b) is whether the student has a non-entry-level first job after college. The outcome variable in sub-figure (c) is the imputed starting salary in 2010 dollars. All specifications control for institution and year fixed effects, along with group-specific linear time trends. I normalize the coefficients to zero for the cohort that enter college three years prior to the switch. The 95% confidence intervals are calculated based on standard errors that are clustered at the institution level.